STATE OF NEW HAMPSHIRE
INTER-DEPARTMENT COMMUNICATION

DATE: 5/13/2019

FROM: Andrew O'Sullivan
Wetlands Program Manager

AT (OFFICE): Department of Transportation
Bureau of Environment

SUBJECT Dredge & Fill Application
Barnstead, 14121

TO Collis Adams, Wetlands Bureau Administrator
New Hampshire Wetlands Bureau
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

Forwarded herewith is the application package prepared by NH DOT Bureau of Highway Design for the subject major impact project. This project is classified as major per Env-Wt 303.02(p). The project is located on NH Route 28 in the Town of Barnstead, NH. The proposed work consists of reconstruction at the intersection of NH 28, North Road and North Barnstead Road and widening a segment of NH 28 to improve safety. Improvements will also be made to North Road and North Barnstead Road. Three stream crossings will be replaced: Sta. 5074+50, existing 36"RC pipe replaced with twin 36" RC pipes; Sta. 5086+50, existing 24"RC pipe replaced with a 30 RC pipe; Sta. 5112+00, existing 48" RC pipe replaced with twin 54" RC pipes and a 36" RC pipes (wildlife friendly).

This project was reviewed at the Natural Resource Agency Coordination Meeting on February 17, 2016, September 20, 2017 and March 20, 2019. A copy of the minutes has been included with this application package. A copy of this application and plans can be accessed on the Departments website via the following link: http://www.nh.gov/dot/org/projectdevelopment/environment/units/program-management/wetland-applications.htm

Mitigation for this project was discussed at the Natural Resource Agency Coordination Meeting. The proposed mitigation consists of acquisition of a 100+/- conservation easement for the town of Barnstead. Should that agreement and contract fall through; a single onetime in-lieu fee payment in the amount of $177,861.05 will be made.

The lead people to contact for this project are Tobey Reynolds, Bureau of Highway Design (271-2731 or tobey.reynolds@dot.nh.gov) or Andrew O'Sullivan, Wetlands Program Manager, Bureau of Environment (271-3226 or Andrew. O'Sullivan@dot.nh.gov)

A payment voucher has been processed for this application (Voucher #569495) in the amount of $7,568.60.

If and when this application meets with the approval of the Bureau, please send the permit directly to Andrew O'Sullivan, Wetlands Program Manager, Bureau of Environment.

AMO:amo
Enclosures

cc:
BOE Original
Town of Barnstead (4 copies via certified mail)
David Trubey, NH Division of Historic Resources (Cultural Review Within)
Bureau of Construction (via electronic notification)
Carol Henderson, NH Fish & Game (via electronic notification)
Maria Tur, US Fish & Wildlife (via electronic notification)
Mark Kern, US Environmental Protection Agency (via electronic notification)
Michael Hicks, US Army Corp of Engineers (via electronic notification)
Kevin Nyhan, BOE (via electronic notification)

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NHDES-W-06-012

WETLANDS PERMIT APPLICATION

Water Division/ Wetlands Bureau
Land Resources Management

Check the status of your application: www.des.nh.gov/onestop

RSA/Rule: RSA 482-A/ Env-Wt 100-900

Administrative Use Only	Administrative Use Only	Administrative Use Only	File No.:
			Check No.:
			Amount:
			Initials:

1. REVIEW TIME: Indicate your Review Time below. To determine review time, refer to Guidance Document A for instructions.

☒ Standard Review (Minimum, Minor or Major Impact) ☐ Expedited Review (Minimum Impact only)

2. MITIGATION REQUIREMENT:

If mitigation is required, a Mitigation-Pre Application meeting must occur prior to submitting this Wetlands Permit Application. To determine if mitigation is required, please refer to the Determine if Mitigation is Required Frequently Asked Questions.

Mitigation Pre-Application Meeting Date: Month: 03 Day: 20 Year: 2019

☐ N/A - Mitigation is not required

3. PROJECT LOCATION:

Separate wetland permit applications must be submitted for each municipality within which wetland impacts occur.

ADDRESS: **NH 28, North Road, and North Barnstead Road**			TOWN/CITY: **Barnstead**
TAX MAP: **N/A**	BLOCK: **N/A**	LOT: **N/A**	UNIT: **N/A**
USGS TOPO MAP WATERBODY NAME: **Included, unnnamed streams** ☐ NA		STREAM WATERSHED SIZE: ☐ NA	
LOCATION COORDINATES (If known): **begin:** 43d 22'51.64", -71d15'22.09" **end:** 43d 23'37.15", -71d14'27.26"		☒ Latitude/Longitude ☐ UTM ☐ State Plane	

4. PROJECT DESCRIPTION:

Provide a brief description of the project outlining the scope of work. Attach additional sheets as needed to provide a detailed explanation of your project. DO NOT reply "See Attached" in the space provided below.

This project will reconstruct the intersection of NH 28, North Road and North Barnstead Road and widen a segment of NH 28 to improve safety. Improvements will also be made to North Road and North Barnstead Road. Three stream crossings will be replaced: Sta. 5074+50, existing 36"RC pipe replaced with twin 36" RC pipes; Sta. 5086+50, existing 24"RC pipe replaced with a 30 RC pipe; Sta. 5112+00, existing 48" RC pipe replaced with twin 54" RC pipes and a 36" RC pipes (wildlife friendly).

5. SHORELINE FRONTAGE:

☐ N/A This does not have shoreline frontage. SHORELINE FRONTAGE: **585 Feet**

Shoreline Frontage is calculated by determining the average of the distances of the actual natural navigable shoreline frontage and a straight line drawn between the property lines, both of which are measured at the normal high water line (Env-Wt 101.89).

6. RELATED NHDES LAND RESOURCES MANAGEMENT PERMIT APPLICATIONS ASSOCIATED WITH THIS PROJECT:

Please indicate if any of the following permit applications are required and, if required, the status of the application.

To determine if other Land Resources Management Permits are required, refer to the Land Resources Management Webpage.

Permit Type	Permit Required	File Number	Permit Application Status
Alteration of Terrain Permit Per RSA 485-A:17	☐ YES ☒ NO	____	☐ APPROVED ☐ PENDING ☐ DENIED
Individual Sewerage Disposal per RSA 485-A:2	☐ YES ☒ NO	____	☐ APPROVED ☐ PENDING ☐ DENIED
Subdivision Approval Per RSA 485-A	☐ YES ☒ NO	____	☐ APPROVED ☐ PENDING ☐ DENIED
Shoreland Permit Per RSA 483-B	☒ YES ☐ NO	____	☐ APPROVED ☐ PENDING ☐ DENIED

7. NATURAL HERITAGE BUREAU & DESIGNATED RIVERS:

See the Instructions & Required Attachments document for instructions to complete a & b below.

a. Natural Heritage Bureau File ID: NHB 19 - 0705 .

b. ☐ This project is within a Designated River corridor. The project is within ¼ mile of: _____; and date a copy of the application was sent to the Local River Management Advisory Committee: Month: __ Day: __ Year: ____

☒ N/A – This project is not within a Designated River corridor.

8. APPLICANT INFORMATION (Desired permit holder)

LAST NAME, FIRST NAME, M.I.: **NH Dept. of Transportation**

TRUST / COMPANY NAME: **NH Dept. of Transportation**	MAILING ADDRESS: **PO Box 483**	
TOWN/CITY: **Concord**	STATE: **NH**	ZIP CODE: **03302-0483**
EMAIL or FAX: **Donald.Lyford@dot.nh.gov**	PHONE: **(603) 271-2165**	

ELECTRONIC COMMUNICATION: By initialing here: DL I hereby authorize NHDES to communicate all matters relative to this application electronically.

9. PROPERTY OWNER INFORMATION (If different than applicant)

LAST NAME, FIRST NAME, M.I.: **NH Dept. of Transportation**

TRUST / COMPANY NAME: **NH Dept. of Transportation**	MAILING ADDRESS: **7 Hazen Drive, PO Box 483**	
TOWN/CITY: **Concord**	STATE: **NH**	ZIP CODE: **03302-0483**
EMAIL or FAX: **Andrew.O'Sullivan@dot.nh.gov**	PHONE: **(603) 271-2171**	

ELECTRONIC COMMUNICATION: By initialing here _____, I hereby authorize NHDES to communicate all matters relative to this application electronically.

10. AUTHORIZED AGENT INFORMATION

LAST NAME, FIRST NAME, M.I.:	COMPANY NAME:	
MAILING ADDRESS:		
TOWN/CITY:	STATE:	ZIP CODE:
EMAIL or FAX:	PHONE:	

ELECTRONIC COMMUNICATION: By initialing here _____, I hereby authorize NHDES to communicate all matters relative to this application electronically.

11. PROPERTY OWNER SIGNATURE:

See the Instructions & Required Attachments document for clarification of the below statements

By signing the application, I am certifying that:

1. I authorize the applicant and/or agent indicated on this form to act in my behalf in the processing of this application, and to furnish upon request, supplemental information in support of this permit application.
2. I have reviewed and submitted information & attachments outlined in the Instructions and Required Attachment document.
3. All abutters have been identified in accordance with RSA 482-A:3, I and Env-Wt 100-900.
4. I have read and provided the required information outlined in Env-Wt 302.04 for the applicable project type.
5. I have read and understand Env-Wt 302.03 and have chosen the least impacting alternative.
6. Any structure that I am proposing to repair/replace was either previously permitted by the Wetlands Bureau or would be considered grandfathered per Env-Wt 101.47.
7. I have submitted a Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) to the NH State Historic Preservation Officer (SHPO) at the NH Division of Historical Resources to identify the presence of historical/ archeological resources while coordinating with the lead federal agency for National Historic Preservation Act (NHPA) 106 compliance.
8. I authorize NHDES and the municipal conservation commission to inspect the site of the proposed project.
9. I have reviewed the information being submitted and that to the best of my knowledge the information is true and accurate.
10. I understand that the willful submission of falsified or misrepresented information to the NHDES is a criminal act, which may result in legal action.
11. I am aware that the work I am proposing may require additional state, local or federal permits which I am responsible for obtaining.
12. The mailing addresses I have provided are up to date and appropriate for receipt of NHDES correspondence. NHDES will not forward returned

Donald Lyford	Donald Lyford	5/8/19
Property Owner Signature	Print name legibly	Date

MUNICIPAL SIGNATURES

12. CONSERVATION COMMISSION SIGNATURE

The signature below certifies that the municipal conservation commission has reviewed this application, and:

1. Waives its right to intervene per RSA 482-A:11;
2. Believes that the application and submitted plans accurately represent the proposed project; and
3. Has no objection to permitting the proposed work.

	Print name legibly	Date
⇨		

DIRECTIONS FOR CONSERVATION COMMISSION

1. Expedited review ONLY requires that the conservation commission's signature is obtained in the space above.
2. Expedited review requires the Conservation Commission signature be obtained **prior** to the submittal of the original application to the Town/City Clerk for signature.
3. The Conservation Commission may refuse to sign. If the Conservation Commission does not sign this statement for any reason, the application is not eligible for expedited review and the application will be reviewed in the standard review time frame.

13. TOWN / CITY CLERK SIGNATURE

As required by Chapter 482-A:3 (amended 2014), I hereby certify that the applicant has filed four application forms, four detailed plans, and four USGS location maps with the town/city indicated below.

	Print name legibly	Town/City	Date
⇨			

DIRECTIONS FOR TOWN/CITY CLERK:

Per RSA 482-A:3,I

1. For applications where "Expedited Review" is checked on page 1, if the Conservation Commission signature is not present, NHDES will accept the permit application, but it will NOT receive the expedited review time.
2. IMMEDIATELY sign the original application form and four copies in the signature space provided above;
3. Return the signed original application form and attachments to the applicant so that the applicant may submit the application form and attachments to NHDES by mail or hand delivery.
4. IMMEDIATELY distribute a copy of the application with one complete set of attachments to each of the following bodies: the municipal Conservation Commission, the local governing body (Board of Selectmen or Town/City Council), and the Planning Board; and
5. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

DIRECTIONS FOR APPLICANT:

1. Submit the single, original permit application form bearing the signature of the Town/ City Clerk, additional materials, and the application fee to NHDES by mail or hand delivery.

14. IMPACT AREA:

For each jurisdictional area that will be/has been impacted, provide square feet and, if applicable, linear feet of impact.

Permanent: *impacts that will remain after the project is complete.*

Temporary: *impacts not intended to remain (and will be restored to pre-construction conditions) after the project is completed.*

Intermittent Streams: *linear footage distance of disturbance is measured along the thread of the channel.*

Perennial Streams/ Rivers: *the total linear footage distance is calculated by summing the lengths of disturbance to the channel and each bank.*

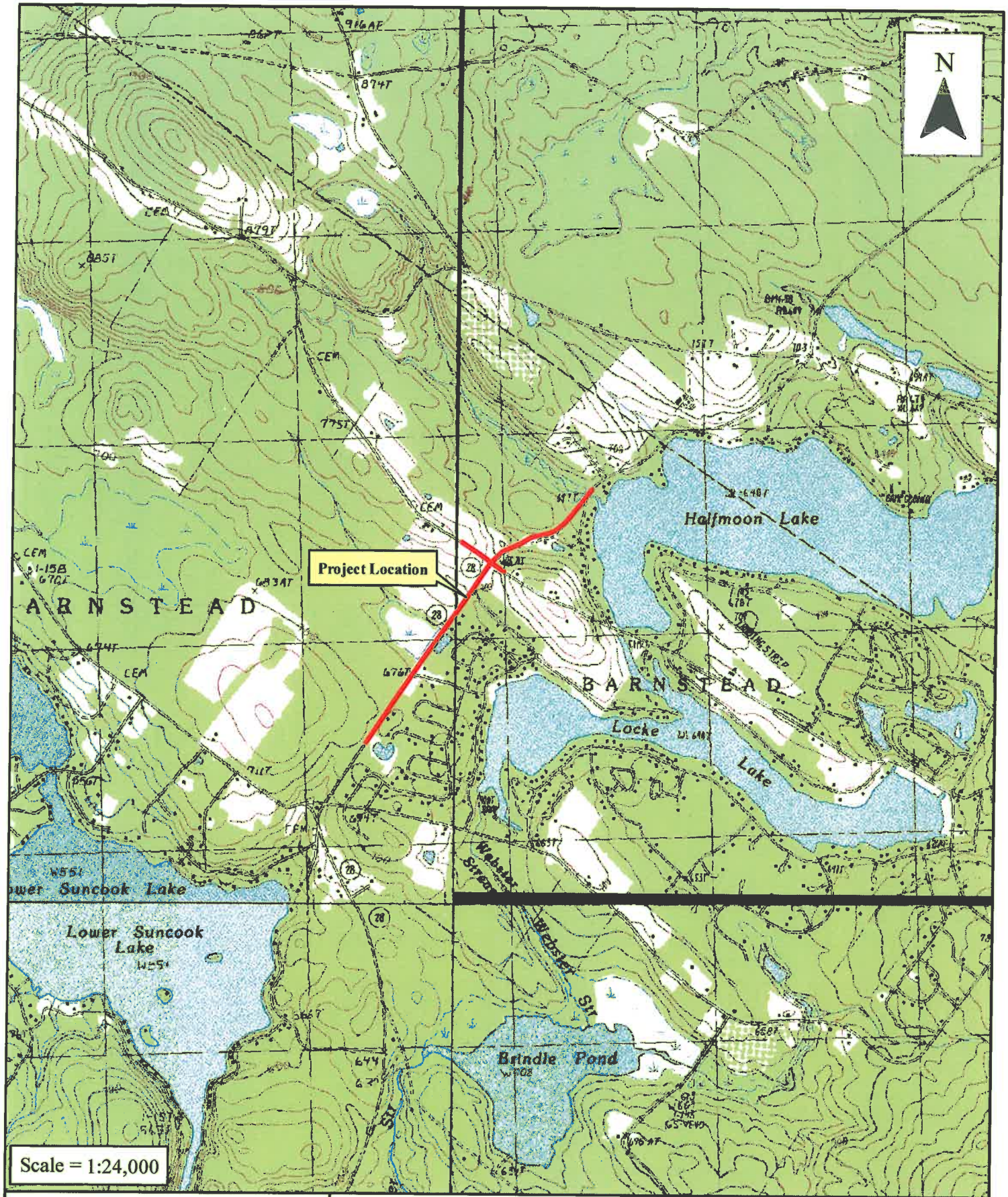
JURISDICTIONAL AREA	PERMANENT Sq. Ft. / Lin. Ft.		TEMPORARY Sq. Ft. / Lin. Ft.	
Forested wetland	10,599 sf	☐ ATF	5,274 sf	☐ ATF
Scrub-shrub wetland	3,301 sf	☐ ATF	1,552 sf	☐ ATF
Emergent wetland	5,497 sf	☐ ATF	3,689 sf	☐ ATF
Wet meadow		☐ ATF		☐ ATF
Intermittent stream channel	383 sf / 64 lf	☐ ATF	160 sf / 30 lf	☐ ATF
Perennial Stream / River channel	1,134 sf / 105 lf	☐ ATF	3,926 sf / 46 lf	☐ ATF
Lake / Pond	/	☐ ATF	341 sf / 13 lf	☐ ATF
Bank - Intermittent stream	/	☐ ATF	/	☐ ATF
Bank - Perennial stream / River	636 sf / 241 lf	☐ ATF	1,351 sf / 146 lf	☐ ATF
Bank - Lake / Pond	/	☐ ATF	/	☐ ATF
Tidal water	/	☐ ATF	/	☐ ATF
Salt marsh		☐ ATF		☐ ATF
Sand dune		☐ ATF		☐ ATF
Prime wetland		☐ ATF		☐ ATF
Prime wetland buffer		☐ ATF		☐ ATF
Undeveloped Tidal Buffer Zone (TBZ)		☐ ATF		☐ ATF
Previously-developed upland in TBZ		☐ ATF		☐ ATF
Docking - Lake / Pond		☐ ATF		☐ ATF
Docking - River		☐ ATF		☐ ATF
Docking - Tidal Water		☐ ATF		☐ ATF
Vernal Pool		☐ ATF		☐ ATF
TOTAL	21,550 sf / 410 lf		16,293 sf / 235 lf	

15. APPLICATION FEE: See the Instructions & Required Attachments document for further instruction

☐ Minimum Impact Fee: Flat fee of $ 200

☒ Minor or Major Impact Fee: Calculate using the below table below

Permanent and Temporary (non-docking)	**37,843** sq. ft.	X $0.20 =	**$ 7,568.60**
Temporary (seasonal) docking structure:	**0** sq. ft.	X $1.00 =	**$ 0**
Permanent docking structure:	**0** sq. ft.	X $2.00 =	**$ 0**
Projects proposing shoreline structures (including docks) add $200 =			**$ 0**
Total =			**$ 7,568.60**
The Application Fee is the above calculated Total or $200, whichever is greater =			**$ 7,568.60**



NH Route 28 Safety Improvements
NHDOT Project No. 14121
Barnstead, New Hampshire

Exhibit A
USGS Topographic Map

The Smart Associates
Environmental Consultants, Inc.

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

WETLANDS PERMIT APPLICATION – ATTACHMENT A
MINOR AND MAJOR - 20 QUESTIONS

Land Resources Management
Wetlands Bureau

Check the Status of your application: www.des.nh.gov/onestop

RSA/ Rule: RSA 482-A, Env-Wt 100-900

Env-Wt 302.04 Requirements for Application Evaluation - For any major or minor project, the applicant shall demonstrate by plan and example that the following factors have been considered in the project's design in assessing the impact of the proposed project to areas and environments under the department's jurisdiction. Respond with statements demonstrating:

1. The need for the proposed impact.

The proposed reconstruction of NH Route 28 will begin approximately 1,800 ft south of Colony Drive and proceed northerly 6,150 ft to a point approximately 550 ft north of Crescent Drive. This project will improve safety along NH Route 28 by flattening horizontal and vertical curves, increasing intersection sight distance, and widening shoulder widths. The roadway currently consists of a single 12 ft travel lane in each direction with little to no paved shoulder. The proposed pavement layout consists of 12 foot travel lanes and 4 foot shoulders.

As part of reconstructing the NH Route 28 intersection with North Road and North Barnstead Road, work proceeds westerly for 550' along North Road and easterly for 350' along North Barnstead Road. This work is included to reconstruct the intersection of NH 28, North Road and North Barnstead Road to flatten a crest curve and widen a segment of NH 28 to improve safety.

Three stream crossings will be replaced: Sta. 5074+50, existing 36"RC pipe replaced with twin 36" RC pipes; Sta. 5086+50, existing 24"RC pipe replaced with a 30 RC pipe; Sta. 5112+00, existing 48" RC pipe replaced with twin 54" RC pipes and a 36" RC pipes (wildlife friendly).

Six stormwater treatment swales for water quality will be constructed as part of the project.

2. That the alternative proposed by the applicant is the one with the least impact to wetlands or surface waters on site.

This alternative utilizes minimal lane and shoulder widths to minimize the project impacts.

The no build alternative would provide no safety improvements. It was not considered a viable option, as it does not address the existing deficiencies, or safety concerns of the project.

3. The type and classification of the wetlands involved.

SEE ATTACHED SHEET

4. The relationship of the proposed wetlands to be impacted relative to nearby wetlands and surface waters.

Impacts associated with this project will not negatively affect nearby wetlands and surface waters. Drainage patterns will be maintained and it is not expected that hydrology will change. With the incorporation of permanent water quality treatment measures, water quality in nearby wetlands should be enhanced. Portions of wetlands will be impacted however, impacts will not be to a degree that will result in broader impacts beyond what will be permitted. Generally the impact to the wetlands are just strips along the side of the roadway.

5. The rarity of the wetland, surface water, sand dunes, or tidal buffer zone area.

Impacted and nearby wetlands are not rare or uncommon in NH.

6. The surface area of the wetlands that will be impacted.

The proposed work will result in 37, 843 square feet of wetland impacts, which 21,550 square feet are permanent impacts and 16, 293 square feet are temporary impacts.

Delineated Wetlands:

19,397 square feet of permanent and 10,515 square feet are temporary impacts

Perrenial Streams:

1,134 square feet of permanent and 3,296 square feet are temporary impacts to perrenial stream channels

636 square feet of permanent and 1,351 square feet are temporary impacts to perrenial stream banks

Intermittent Streams:

383 square feet of permanent and 160 square feet are temporary impacts to intermittent stream channels

7. The impact on plants, fish and wildlife including, but not limited to:
   a. Rare, special concern species;
   b. State and federally listed threatened and endangered species;
   c. Species at the extremities of their ranges;
   d. Migratory fish and wildlife;
   e. Exemplary natural communities identified by the DRED-NHB; and
   f. Vernal pools.

The results of the NH Natural Heritage Bureau database review are enclosed. The common loon was identified as being a State Threatened species within the vicinity of the project area. Through coordination with Kim Tuttle and John Cooley at F&G it was determined there is no concern because the loons are no longer nesting at the Rt. 28 end of Half Moon Lake. "The NHFG Nongame and Endangered Wildlife Program concurs with the findings of John Cooley and [they] do not expect disturbance impacts to nesting common loon from consturction activities for the Barnstead NH Route 28 road improvements." No other hits for plants, fish, and wildlife associated with lines a. through e. above where identified by NHB.

The results of the US Wildlife Service's Information fror Planning and Conservation (IPaC) are enclosed. USFWS identified the federally listed Northern Long-eared bat (NLEB) and the small whorled pogonia as two species with critical habitat wihtin the project area. Through coordination and consultation with USFWS' New England Office, on the scope of work, it was determined that the impacts and project will "likely adversely affect" the NLEB because the proposed tree clearing may affect trees potentially occupied by the NLEB during the active season.

The project area was surveyed on May 6, 2016 and June 13, 2016 for the presence of small whorled pogonia; no pogonia were identified.

8. The impact of the proposed project on public commerce, navigation and recreation.

The project shall only improve public commerce, navigation and recreation by improving the safety and lifespan of NH Route 28. Acccess will be maintained to nearby businesses and residences during construction utilizing alternating one-way trafffic.

9. The extent to which a project interferes with the aesthetic interests of the general public. For example, where an applicant proposes the construction of a retaining wall on the bank of a lake, the applicant shall be required to indicate the type of material to be used and the effect of the construction of the wall on the view of other users of the lake.

The project does not interfere with the aesthetics of the general public. Two stonewalls that are impacted by the project shall be reconstructed.

10. The extent to which a project interferes with or obstructs public rights of passage or access. For example, where the applicant proposes to construct a dock in a narrow channel, the applicant shall be required to document the extent to which the dock would block or interfere with the passage through this area.

The proposed project will not interfere with or obstruct the public rights of passage or access. Access will be maintained to nearby businesses and residences during construction utilizing one-way traffic.

11. The impact upon abutting owners pursuant to RSA 482-A:11, II. For example, if an applicant is proposing to rip-rap a stream, the applicant shall be required to document the effect of such work on upstream and downstream abutting properties.

This project should have positive impact on the upstream and downstream abutting properties as it will help ensure that stromwater runoff from the roadway is being captured and treated appropriately, and those crossings carrying wetlands and streams are not at risk for collapse or other structural deficiencies which would impair the funciton of the drainage system and possibly result in erosion and sedimentation of the waterways flowing through the project.

12. The benefit of a project to the health, safety, and well being of the general public.

The proposed project will benefit the health, safety, and well being of the general public. The flattening of horizontal and vertical curves as well as widening of the roadway will create a safer corridor for vehicles and pedestrians.

13. The impact of a proposed project on quantity or quality of surface and ground water. For example, where an applicant proposes to fill wetlands the applicant shall be required to document the impact of the proposed fill on the amount of drainage entering the site versus the amount of drainage exiting the site and the difference in the quality of water entering and exiting the site.

There will be a slight increase in impervious area due to the widening of the shoulders. However the incorporation of six permanent treatment swales and temporary water quality best management practices, water quaility will be protected during construction and permanently enhanced following construction.

14. The potential of a proposed project to cause or increase flooding, erosion, or sedimentation.

The proposed project is not expected to increase flooding, erosion, or sedimentation. Appropriate BMP's will be kept in place throughout construction. It is expected the drainage improvements will reduce the potential of flooding, erosion, or sedimentation.

15. The extent to which a project that is located in surface waters reflects or redirects current or wave energy which might cause damage or hazards.

Not applicable, the project will not be reflecting or redirecting current or wave energy.

16. The cumulative impact that would result if all parties owning or abutting a portion of the affected wetland or wetland complex were also permitted alterations to the wetland proportional to the extent of their property rights. For example, an applicant who owns only a portion of a wetland shall document the applicant's percentage of ownership of that wetland and the percentage of that ownership that would be impacted.

Not applicable, abutting landowners will not be constructiong a similar highway design project. Therefor, no impact to the overall wetland compleax are anticipated.

17. The impact of the proposed project on the values and functions of the total wetland or wetland complex.

There will be little impact to the overall values and functions of the total wetland complex. The impacts are mostly strip impacts to the wetland system located along the edge of the roadway. The mix of palustrine emergent, scrub shrub, and forested wetlands serve as groundwater recharge/discharge, floodflow aleration, sediment/toxicant/pathogen retention, wildlife habitat, and visual quality.

18. The impact upon the value of the sites included in the latest published edition of the National Register of Natural Landmarks, or sites eligible for such publication.

The proposed work will not impact any sites included in, or eligible for inclusion in, the National Register of Natural Landmarks.

19. The impact upon the value of areas named in acts of congress or presidential proclamations as national rivers, national wilderness areas, national lakeshores, and such areas as may be established under federal, state, or municipal laws for similar and related purposes such as estuarine and marine sanctuaries.

Not applicable, no such areas are near the project.

20. The degree to which a project redirects water from one watershed to another.

The project will not be redirecting water from one watershed to another.

Additional comments

3. The type and classification of the wetlands involved.

PEM1D – (palustrine, emergent, persistent, continuously saturated)

PEM1E – (palustrine, emergent, persistent, seasonally flooded/saturated)

PEM/PFO1E – (palustrine, emergent, persistent/palustrine, forested, broad-leaved deciduous, seasonally flooded/saturated)

PEM/PSS1E – (palustrine, emergent, persistent/palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded/saturated)

PFO1E – (palustrine, forested, broad-leaved deciduous, seasonally flooded/saturated)

PSS1E – (palustrine, scrub-shrub, broad leaved deciduous, seasonally flooded/saturated)

PSS/PFO1E – (palustrine, scrub-shrub/palustrine, forested, broad-leaved deciduous, seasonally flooded/saturated)

PSS/PFO1Fh – (palustrine, scrub-shrub/palustrine, forested, broad-leaved deciduous, semipermanently flooded, diked/impounded)

PUBHh – (palustrine, unconsolidated bottom, permanently flooded, dike/impounded)

R2UB1, 2 – (riverine, lower perennial, unconsolidated bottom, cobble-gravel, sand)

R2UB4 – (riverine, lower perennial, unconsolidated bottom, organic)

R4SB3, 4 – (riverine, intermittent, streambed, cobble-gravel, sand)

BUREAU OF ENVIRONMENT
CONFERENCE REPORT

SUBJECT: NHDOT Monthly Natural Resource Agency Coordination Meeting
DATE OF CONFERENCE: February 17, 2016
LOCATION OF CONFERENCE: John O. Morton Building
ATTENDED BY:

NHDOT
Matt Urban
Ron Crickard
Anthony Weatherbee
Kerry Ryan
Marc Laurin
Sam Fifield
Joe Adams
Carol Niewola
Jon Evans
Bob Juliano
Mike Dugas
Keith Cota

Army Corps of Engineers
Michael Hicks

NHDES
Gino Infascelli
Lori Sommer
Katie Zink
Greg Cummings
Deb Loiselle

NH Fish & Game
Carol Henderson

NHB/DRED
Amy Lamb

Consultants/Public Participants
Jed Merrow
David Nelson
Christine Perron
Rick Dyment
Brian Colburn
Josh Lund
Rob Faulkner
Bill Ashford
David McNamara
Vicki Chase
Jennifer Riordan
John Trottier
Chris Bean
Ian Broadwater
Mark Hutchins
Leo Tidd

PRESENTATIONS/ PROJECTS REVIEWED THIS MONTH:
(minutes on subsequent pages)

(When viewing these minutes online, click on a project to zoom to the minutes for that project)

change to the riverbed). A coffer dam (sandbags) will be placed around the work area to divert flow and inside of the coffer dam a turbidity barrier will be placed, but the work will occur in the wet. For the southern piers riprap will be placed from the northern work pads around the piers by a crane, eliminating the need to disturb the southern bank. There will be temporary impacts to the riverbank and riverbed for the scour protection operation with three workpads proposed to be installed within the river (clean stone). A-Jacks are manufactured ahead of time and banded together on land, and placed in a group on the riverbed.

Matt Urban noted that the project would not require mitigation because the permanent impacts were all for the protection of existing infrastructure and so is exempt from the need to mitigate. Matt also asked if the sandbag footprint had been included as impact, and noted that it should be. The entire area within the sandbags need not be counted as impact, only the areas to be directly impacted.

Carol Henderson asked if access within the river would be maintained. B. Ashford indicated that the south side of the river would remain open to boaters.

Rob Faulkner asked if the A-Jacks would be considered permanent impact since they would be covered with natural material. Lori Sommer and Matt Urban concurred that it would be permanent impact.

Outstanding issues for this project – NEPA and Section 4(f) have not yet been completed. Wetland and shoreland permit applications will be submitted in the near future.
Mike Hicks noted that if floodplain mitigation is required that it should be adequately sized.
Jon Evans noted that although DOT's checklist required existing and proposed conditions for erosion control plans, this project has very little in the way of contour changes and confirmed that proposed contours would not be needed.

Barnstead, 14121, X-A000(208)

The project involves improvements to NH Route 28 in Barnstead and is the next in a series of projects along Route 28 in Barnstead and Alton. Within the project corridor, Route 28 is narrow and has no shoulders. There is also poor sight distance at the Route 28/North Barnstead Road/North Road intersection. The purpose of the project is to widen the road, add 4-foot shoulders, and improve sight lines at the intersection. Both the horizontal and vertical road alignments will be adjusted. Route 28 will be shifted to the west in order to avoid residential impacts to the east of the road. Vertical alignment adjustments will include lowering the crest and raising the sag near the Route 28/North Barnstead Road/North Road intersection. Work along North Road and North Barnstead Road is proposed to match the lower Route 28 vertical alignment.

The project is approximately 1 mile in length. The southern end matches into the Peacham Road project (Project No. 14121E). Construction is scheduled for 2019.

Wetlands are located along the project corridor. Permanent wetland impacts are estimated at approximately 0.5 acres. Approximately 1 acre of new impervious surface is proposed from the addition of 4-foot shoulders.

One perennial stream (Tier 2) crossing is located in the project corridor. The crossing may be impacted since the existing culvert is old, but impacts are currently not known.

Lori Sommer asked if there are any Natural Heritage records nearby. Jenn Riordan replied that one record is located nearby, but the report indicated that no impact is anticipated. Jenn added that the US Fish and Wildlife Service IPaC report indicated that small whorled pogonia and northern long-eared bat may occur within the project area. Since the wetland delineation was completed late last fall, a spring/summer survey for small whorled pogonia is proposed. No clearing restrictions are anticipated for northern long-eared bat under the new 4(d) rule.

There are no impaired waters within the project corridor, although some of the downstream waterbodies have impairments. Locke Lake and Halfmoon Lake are located east of the project. No shoreland impacts are anticipated. The project is located just beyond Halfmoon Lake's Protected Shoreland (project limits are approximately 300 feet from the edge of Halfmoon Lake).

Historic and archaeological reviews are ongoing. There are several potentially historic buildings within the project corridor and also several areas that need Phase IB archaeological testing.

The project will likely need to be presented at a future Natural Resource Agency meeting once the design and impacts have been refined. The project will involve ROW impacts and a public hearing is proposed. The first public information meeting is scheduled for March 16, 2016.

Derry-Londonderry, 13065, IM-0931(201)

1. Purpose of Meeting

a. To provide overview of the proposed scope of work to update the Exit 4A EIS, based on a series of EIS Review Team meetings that have now been completed.
b. To discuss eNEPA.

2. Overview of Proposed Scopes of Work

a. Base Mapping: Update aerial and contour mapping from 1998/1999 to 2014.
b. Traffic: Update traffic counts to 2015. Utilize Southern NH Regional Planning's Traffic Model taking into consideration latest available population and employment projections, projects in the State's Ten Year Transportation Plan and known projects in the area that are reasonably foreseeable. 2020 Opening Year and 2040 Design Year traffic capacity conditions will be evaluated.
c. Socioeconomic: Update all previous data sources and trend analyses.
d. Air Quality and Noise: Perform updates that conform to the latest regulations.
e. Cultural Resources (Historic): Consider if additional properties greater than 50 years old now require National Register eligibility evaluations.
f. Cultural Resources (Archaeologic): Perform updated file searches to identify potential prehistoric and historic sites.

BUREAU OF ENVIRONMENT
CONFERENCE REPORT

SUBJECT: NHDOT Monthly Natural Resource Agency Coordination Meeting
DATE OF CONFERENCE: September 20, 2017
LOCATION OF CONFERENCE: John O. Morton Building
ATTENDED BY:

NHDOT
Matt Urban
Sarah Large
Ron Crickard
Mark Hemmerlein
Marc Laurin
Meli Dube
Josh Lafond
Kathy Corliss
Jennifer Reczek
Joseph Adams
Charles Willeke
Jason Trembley
John Butler
Tobey Reynolds
Jim Kirouac
Tim Mallette
James Bowles

ACOE
Mike Hicks

EPA
Mark Kern

NHDES
Gino Infascelli
Chris Williams

NHF&G
Carol Henderson

NH Natural Heritage Bureau
Amy Lamb

Consultants/Public Participants
Joshua McAllister
Vicki Chase
Thomas Marshal
Darren Blood
Kim Smith
Christine Perron

(When viewing these minutes online, click on an attendee to send an e-mail)

PRESENTATIONS/ PROJECTS REVIEWED THIS MONTH:
(minutes on subsequent pages)

(When viewing these minutes online, click on a project to zoom to the minutes for that project)

Amy Lamb asked if there would be encroachment on the Exemplary Natural Communities identified by NHB. NAI will coordinate with NHNHB to answer their concerns.

Gino Infascelli asked when the application would be submitted in the design process. The permit applications will show the design being presented. If the design builder wants to change the design and increase the impacts, they will have to obtain permits for those impacts, and assume the risk for any project delays this could create. M. Hicks cautioned that changes in design could delay the project. G. Infascelli pointed out that the design would go to G&C for approval so it wouldn't matter if the impacts were the same, if the design had changed.

This project has been previously discussed at the 11/20/2013 and 2/18/2015 Monthly Natural Resource Agency Coordination Meetings.

Barnstead, #14121 (X-A000(208))

Joshua Lafond – Provided an overview of the project describing the overlap with the Barnstead 14121E project that is currently under construction. He described that the project will increase the roadway typical from the existing 12' travel way and 1' shoulder to a 12' travel way and 4' shoulder typical. In addition to the increase in the shoulder width, the horizontal and vertical alignments of NH Route 28 will be modified to provide safety improvements at the intersection of NH Route 28 and North Road and North Barnstead Road. The drainage located within the project limits will be improved with 6 treatment swales proposed to be located throughout the project to treat storm water runoff.

Kathy Corliss – Explained the location of the 48" culvert at the northern end of the project was constructed during the 1930's, drains into Halfmoon Lake and has one recorded occurrence of water overtopping the roadway around 2006. She reviewed the following alternatives and stated that all options are hydraulically compliant:

1. Stream Crossing Compliant 12' Open Span – would potentially have least permanent bank and channel impact but could be the most expensive option with a current estimate of $120,000 – $170,000. (After meeting it was clarified that not mitigation is required for stream compliant structures)
2. Twin 54" RCP pipes – would have greater bank and channel impacts, but would be the most economical with a current estimate of $54,000.
3. Twin 66' and 54" Poly Coated CMP Arches – similar bank and channel impacts to the Twin 54" RCP pipes option with a current estimate of $84,000 with no additional benefits over the Twin 54" RCP pipes other can cover over the pipes.
4. 8'x5' Box Concrete Box Culvert – would be similar to the 12' Open Span option but would require additional impacts for clean water bypass and be less expensive with a current estimate of $110,000.

K. Corliss explained that all these options do not currently have any mitigation costs included within the estimates and described that the preferred option for design is currently the Twin 54" RCP pipes.

Mike Hicks asked if the application discussed at the meeting today would be for the entire project or specifically for this culvert and asked if any wetland impact numbers had been quantified yet. *Ron Crickard answered that the project will have less than 3 acres of impact but no impacts have been calculated yet for the project.*

Gino Infascelli stated that the preferred option of the Twin 54" RCP pipes does not consider an option for wildlife passage. Carol Henderson added that the existing 48" culvert appears to be perched at the outlet. Tim Mallette responded that the proposed options would lower the inverts for the pipes and that the

modeled water levels would allow for continuous flow through the proposed pipes. No perch would be present in any of the proposed options.

Mark Kern asked if any wildlife kills information was available for the location. K. Corliss answered that Highway Design does not have any information on wildlife kills but could touch base with District on this. G. Infascelli suggested Highway Design consider adding a dry wildlife passage similar to the Rochester project with potentially finding a location offset from the Twin 54" RCP pipes to install a wildlife corridor.

M. Kern asked how important the compliance and wildlife passage is in this location and noted mitigation costs associated with the alternative options could make the Stream Crossing Compliant 12' Open Span option more desirable. Further discussion with Lori Sommer would be needed.

Amy Lamb indicated that the NHB for the project has expired and added that a Loon nest is located at the inlet of Halfmoon Lake. C. Henderson stated that a time of year restriction for construction may be required. *Matt Urban replied that the loon nest is located outside the areas of impact.* T. Mallette stated that a weir controls the inlet of Halfmoon Lake and the stream is only a tributary into the pond and does not foresee any impacts to the lake during or after construction.

Jim Kirourac asked if a wildlife passage was to be proposed, what size passage would be recommended. G. Infascelli responded that minimum 36" pipe would be acceptable. (Further discussion indicated that concrete is preferred, corrugated metal is acceptable, but plastic pipe is not.)

M. Urban stated that the project should evaluate the possibility for an independent wildlife passage within this location and that the preferred option of the Twin 54" RCP pipes are acceptable at this time. Highway Design would likely present the entire project in a few months after Slope and Drain has been completed.

This project has been previously discussed at the 2/17/2016 Monthly Natural Resource Agency Coordination Meeting.

Orford, #40366 (X-A004(371))

Christine Perron provided an overview of the project area and resources identified to date. This project will address Bridge 217/112, which carries NH Route 25A over Brackett Brook in Orford, approximately 1 mile west of the Wentworth town line. West of the bridge, the stream flows down a steep slope and is parallel to the roadway before it flattens out and takes a sharp turn at the bridge. East of the bridge, the stream flows through an open field associated with a youth camp before it outlets into Pond Brook.

Kim Smith provided an overview of the bridge. The bridge was constructed in 1929 and consists of a 2-span concrete slab with a length of 40' and width of 35.7'. The deck, substructure, and superstructure are in poor condition and there is significant scour at the abutment. The bridge has been on the NHDOT Red List since 2013.

This area was impacted by a flood event in early July and there were substantial washouts along NH Route 25A, Brackett Brook, and other stream crossings. The NHDOT has completed repairs at all flood damaged locations, including bank stabilization and channel reshaping in Brackett Brook immediately upstream of the NH Route 25A bridge.

A wetland delineation was completed at the site. There are three areas of forested wetlands along an overflow area east of the bridge and south of NH Route 25A. This overflow area appeared to carry a substantial amount of water during the recent flood event, as evidenced by a large amount of sediment and debris. The bridge is a Tier 3 stream crossing with a watershed of 4.2 square miles. The approximate

BUREAU OF ENVIRONMENT
CONFERENCE REPORT

SUBJECT: NHDOT Monthly Natural Resource Agency Coordination Meeting
DATE OF CONFERENCE: March 20, 2019
LOCATION OF CONFERENCE: John O. Morton Building
ATTENDED BY:

NHDOT
Matt Urban
Sarah Large
Andrew O'Sullivan
Ron Crickard
Arlene Allen
Marc Laurin
Bob Juliano
Jason Tremblay
Keith Cota
Don Lyford
Rick Faul
Andrew Czachor
Maggie Baldwin
Tobey Reynolds
Josh Lafond
Kathy Corliss
Shaun Flynn

ACOE
Mike Hicks

Federal Highway
Jamie Sikora

NHDES
Lori Sommer
Eben Lewis
Chris Williams

NHF&G
Carol Henderson
Heidi Holman
Brett Ferry

NHB
Amy Lamb

Consultants/Public Participants
Mike Leach
Gerard Fortin
Adam Stockin
Jonathan Pitre
Seth Hill
Brian Colburn
Christine Perron
Burr Phillips
Greg Howard

PRESENTATIONS/ PROJECTS REVIEWED THIS MONTH: *(minutes on subsequent pages)*

(When viewing these minutes online, click on a project to zoom to the minutes for that project)

Carol Henderson inquired about the New England Cottontail potential habitat issue and it was noted that further field study by Normandeau indicated no potential habitat present. It was also noted that there was no need to impact the Fish and Game property.

Marc Laurin noted that the Department will need to perform a bat inspection of the bridge prior to construction to satisfy NLEB requirements.

It was noted that the NHDES Coastal Program wished to confirm that the ATC would pass the 100 year storm event and that the design consider seal level rise. The Department indicated that both of these were the case.

Timing of the five day closure was discussed. Keith Cota explained that the D/B contract required a substantial media outreach plan that is in the process of being developed and that the closure will be well advertised and vetted through surrounding communities and UNH. Jonathan Pitre noted that the D/B RFP allowed for a closure of up to 14 days and the D/B Team's proposal gets that down to five days.

This project has been previously discussed at the 11/20/2013, 2/18/2015, and 9/20/2017 Monthly Natural Resource Agency Coordination Meetings.

Barnstead, #14121 (X-A000(208))

Rick Faul identified the location of the project and noted the limits. He indicated the purpose of the meeting is to provide a project overview of the project prior to submitting a wetland application. Since the application needs to be submitted to allow time for it to be reviewed and approved prior to the project's advertising date in August. The project will reconstruct 1.2 miles of NH Route 28, beginning approximately 1,800 feet south of Colony Drive proceeding north to approximately 550 feet north of Crescent Drive.

The project is a full box reconstruction project, which will widen the existing road, as well as modify the horizontal and vertical alignments. Also, it will reconstruct the North Road/North Barnstead Road intersection by flattening the crest curve. The roadway typical will be widened from an 11 foot lane with one foot shoulders to a 12 lane with four foot shoulders.

The project has been to two Natural Resource Agency Meetings in February 2016 and September 2017. The first meeting in 2016, estimated the project would have 0.5 acres of permanent wetland impacts, and approximately 1 acre of new impervious surface is proposed from the addition of the 4-foot shoulders. The second meeting in 2017 provided options for replacement of the 48" culvert that drains into Half Moon Lake, the existing culvert was installed in the 30's, and overtopped once around 2006. Twin 54's was the preferred option. At the meeting, discussion included the twin 54" pipes did not consider an option for wildlife passage, and eliminating the perch at the outlet of the existing 48" culvert was desired.

Since this meeting, the Department has added a 36" pipe for wildlife passage in addition to the twin 54's. R. Faul explained how the twin 54's pipe invert have been lowered to eliminate the perch and that a 36" pipe with an invert one foot above the 54" pipe inverts has been added for wildlife passage and additional capacity during large rainfall events. As part of the project, six treatment swales for water quality will be constructed.

There are three streams within the project limits (two perennial, and one intermittent). Details on the Tiers of the stream, the size of the watershed to the stream, the existing culvert size for the stream, and the proposed culvert size for each location was provided. Details are as follows:

- Tier 2, 218 acres, Sta. 5074+50, Exist. 36" rcp, Prop. 2-36" RC pipes
- Tier 1, 20 acres, Sta. 5087+00, Exist. 24" rcp, Prop. 1-30" plastic
- Tier 3, 704 acres, Sta. 5112+00, Exist. 48" rcp, Prop. 2-54" RC and 1-36" RC pipes

It was noted the Tier 2 and 3 streams are perennial, and the Tier 1 stream is intermittent. R.Faul explained how the twin 54's pipe invert have been lowered to eliminate the perch and that a 36" pipe with an invert one foot above the 54" pipe inverts has been added for wildlife passage and additional capacity during large rainfall events.

Total wetland impacts are 38,000 SF (Permanent impacts 22,000 SF and Temporary impacts 16,000SF). The linear stream impacts for mitigation are 410 LF. Permanent wetland impact greater than 10,000 SF, and impacts to streams requires a payment to the NHDES Aquatic Resource Mitigation (ARM) Fund in lieu of mitigation.

ARM Fund payments amounts are: wetland payment mitigation is $76,000 and stream payment mitigation is $102,000. Total mitigation cost is $178,000.

No other concerns were mentioned regarding the impacts.

Sarah Large addressed the Departments review of the Stream Passage Improvement Program (SPIP) to mitigate for Barnstead 14121's impacts to streams. She expressed that we anticipated the stream impacts associated with the project would meet the threshold to investigate possible crossing replacement candidates through the SPIP. She advised that she took the first step of the SPIP and performed an initial review of the existing data. Since the project is nearing submitting a wetlands permit application we have a better sense of the final stream impact numbers and know that the stream mitigation calculates out to $101,548.80 currently. Based on this number the Department does not plan to continue to pursue SPIP as a mitigation option since the funds generated would not be enough to replace a crossing nor leverage enough funds to continue to pursue replacing a crossing as permitee responsible mitigation.

The Barnstead Conservation Commission has expressed interest in utilizing the ARM fund payment to purchase a large parcel of land in town for conservation.

Ron Crickard began a discussion about an additional mitigation opportunity with the Barnstead Conservation Commission (CC) and Bear Paw Regional conservation group. The Department is investigating the potential of providing mitigation funds to secure a parcel of land located in Barnstead in conjunction with the Barnstead Conservation Commission and Bear Paw. Ron mentioned that at this time the Department is just seeking input from the resource agencies as to whether this is a viable alternative to an ARM fund payment worth pursuing. Ron introduced Jim Fougere from the Barnstead CC to discuss the specifics of the parcel.

J. Fougere provided information on a 100 acre parcel referred to as the Sellin property. The parcel is located on the Barnstead/Gilmanton town line near Upper Suncook Lake and is near a 180 acre parcel the town of Barnstead current holds. L. Sommer asked if there were wetlands located on the parcel, Jim Fougere replied that there were and a stream that runs through the property towards Upper Suncook Lake. M. Hicks mentioned he had no concerns with the parcel as mitigation for the project if it were to work out. L. Sommer stated that the parcel seems like a good fit for mitigation for the project, but that it would be good to review the parcel in the spring to look for vernal pools. L. Sommer stated that there are many details, such as appraisals, purchase and sales, to work out in a short period of time, J. Fougere acknowledge that they would need to coordinate with the Bear Paw group very soon to get surveys and the

required information. L. Sommer asked who would own the property or easement on the parcel. Jim replied that his preference would be to have Bear Paw be the primary holder and Barnstead be listed as a secondary easement holder.

L. Sommer suggested a meeting be scheduled to discuss the process. The question was asked if the easement would need to be in place at the time the permit application would be submitted for the project. It was mentioned that the permit could be conditioned, allowing NHDOT to finalize the transaction. M. Urban asked if this opportunity falls through, if the permit could be conditioned that the Department would then revert back to an ARM fund payment. L. Sommer said yes. L. Sommer said the budget should be nailed down quickly for this effort.

M. Hicks asked if all the streams on the project were unnamed, R. Faul said yes. M. Urban showed L. Sommer the impacts to the intermittent stream. L. Sommer and G. Infascelli discussed that the impacts look to be more than what would fall under a routine roadway activity, so they would require mitigation.
Amy Lamb noted that the NHB search indicated that the Small Whorled Pogonia and Loon were present within the project area. R. Crickard stated that a site walk of the project did not locate any Small Whorled Pogonia, and that coordination with Kim Tuttle at NH Fish & Game has not been completed. Ron will reach out to Kim about the Loon. A. Lamb noted the proximity of the project to the Loon nesting area and that noise during construction may be a concern.

The US Fish and Wildlife IPAC report noted there were potential for small whorled pogonia and Northern long eared bat within the project limits. Small whorled pogonias were not observed during two site visits, and clearing restrictions are anticipated to protect the bats habitat.

C. Henderson mentioned Fish and Game reallocates money through G&C to purchase properties. R. Crickard indicated this procedure would be new to the Department.
L. Sommer asked how the coordination will work on the potential mitigation opportunity with Barnstead and Bear Paw. R. Crickard asked for an example of a contract that NHDES uses for such opportunities through the ARM grant program.

G. Infascelli discussed impacts to a stream on the previous Barnstead project, the Stockbridge Corner Road 14121D project. G. Infascelli indicated that he has coordinated with DOT on this location previously indicating that stone fill was placed both upstream and downstream in areas permitted as temporary impacts. The Department hoped that the stone would naturally fill in with sediment. G. Infascelli asked if this could be addressed under the project discussed today. Tobey Reynolds said that the Department will take a look at it.

This project has been previously discussed at the 2/17/2016 and 9/20/2017 Monthly Natural Resource Agency Coordination Meetings.

Plaistow-Kingston, #10044E (X-A000(378))
This project entails re-evaluating and updating the preliminary design of previously proposed improvements to a 1.7-mile segment (Contract E) of the NH Route 125 corridor located in Plaistow and Kingston. The 1.7-mile segment is the only remaining segment that has not yet been constructed from a 6-mile project corridor that was previously studied and approved.

Jennifer Zorn, (MJ) provided a brief summary of the project scope, which includes Wetland Delineation of the 1.7-mile segment, Stream Assessment at two crossings of the Little River, NEPA reevaluation, 15%

Barnstead 14121 Mitigation Summary

The New Hampshire Department of Transportation (NHDOT) is pursing the purchase and preservation of a property in Barnstead, NH referred to as the Sellin Property along Gilmanton Road as NHDOT's permitee-responsible mitigation for Barnstead Project #14121 wetland impacts. The property is identified on the Town of Barnstead's tax records as Map 9 Lot 3. NHDOT is working with the Town of Barnstead and Bear Paw Regional Greenways ("Bear Paw") in this effort. The Barnstead Conservation Commission ("BCC") and Bear Paw have been interested in this piece of property for some time and with the support and funds from NHDOT, this purchase now has the opportunity to come to fruition. By acquiring the Sellin property it would limit access to an undeveloped 60-acre wooded lot (Tax Map 9 Lot 2; "Warburton/Downs") adjacent to the northern shoreline of the Upper Suncook Lake and augment 180 acres of existing conservation land owned by the Town located one lot over (Tax Map 9 Lot 7; "Harrison Lot"). The property will be placed into a conservation easement that will be held by Bear Paw and the Town of Barnstead as the secondary holder. The conservation easement would exclude approximately 3 acres for the residential area which includes the home on the property. NHDOT will pay up to fair market value for the property and is strongly in support of Bear Paw Regional Greenways and the Town holding the conservation easement for the property, as they are the best-suited stewards. Wetlands and upland buffer will be preserved and protected in perpetuity through this mitigation effort.

The property is 100 +/- acres and is very close to the northern end of Upper Suncook Lake, but does not have lake frontage. Based on the National Wetland Inventory's data layer the property is approximately 9.5 acres of mixed palustrine wetlands (PFO, PEM, and PSS) in the northern limits of the property. The remaining 90.5 acres is approximately 74 acres of forest and the rest is agricultural land and residential. Based on the NH Hydrography Dataset flowlines there is approximately 617 linear feet of perennial stream flowing through the wetland complex in the northern limits of the property and is buffered by forest on the property and adjacent properties. The stream's drainage area is approximately 3 sq. mi. and is at the confluence of Upper Suncook Lake. The perennial stream passes through the adjacent property (Tax Map 9 Lot 1) and inlets into Upper Suncook Lake. Upper Suncook Lake is listed as a Herring Stock Location and Migratory Path. There is also approximately 1,673 linear feet of intermittent stream that meanders through the forested area of the property to the wetland complex. The majority of the parcel has been identified as supporting landscape through NH Fish & Game's Wildlife Action Plan (WAP) with a few small areas of highest ranked habitat in NH and in the region in the northern portion of the parcel. (See attached WAP and NWI+ maps).

NHDOT has met with Bear Paw Regional Greenways ("Bear Paw") and Barnstead Conservation Commission ("BCC") to develop a plan that will allow for the purchase of the property easement. A purchase and sales agreement will be executed by Bear Paw and the property owner. Bear Paw will procure the professional services of a licensed appraiser, land surveyor and certified wetland scientist to determine the fair market value, the meets and bounds, and delineated wetland boundaries and functions and values of the property. Bear Paw will also draft easement language that will define the restrictions and uses of the property that will meet the approval of NHDES. Once this information is presented to NHDOT and the attorney general office for review and approval, NHDOT will prepare a contract detailing the terms and conditions of transaction and cost of the easement for review and approval by Governor and Council. Upon approval of G&C, a draft deed will be written for review and approval by NHDOT, NHDES and the Attorney General's Office. Once this has taken place and all parties are in agreement, a closing will be scheduled and the

appropriate funds will be given to Bear Paw by NHDOT for acquisition of the easement and recording of the deed. Once the deed is recorded, the property will be posted as conservation land with prohibited activities clearly stated for its intended use. Bear Paw and the town of Barnstead will monitor the property yearly to ensure the property is being utilized as intended. Copies of those reports will be made available upon request by NHDES or NHDOT.

Bear Paw and the Town will work with NHDOT to complete the Due Diligence materials (outline above) required for the land acquisition so long as the NHDOT, Bear Paw, and the Town of Barnstead can move forward with the purchase of the land and conservation easement. If this effort falls through NHDOT intends to pay a one time in-lieu fee payment to the Aquatic Resource Mitigation Fund equal to the amount of $177,861.05 which is calculated based on the total final impact associated with the project (19,397 SF of mixed palustrine wetland impacts and 410 LF of stream impacts).

Barnstead 14121 Mitigation Summary

NHDES AQUATIC RESOURCE MITIGATION FUND
WETLAND PAYMENT CALCULATION
INSERT AMOUNTS IN YELLOW CELLS

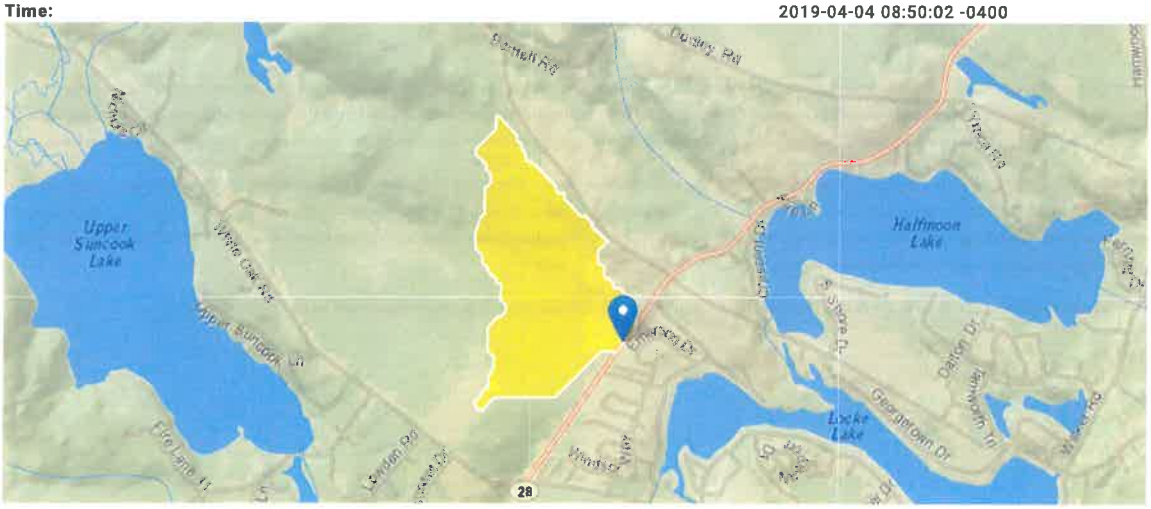
1	**Convert square feet of impact to acres:**		
INSERT SQ FT OF IMPACT	Square feet of impact =		19397.00
			43560.00
	Acres of impact =		0.4453
2	**Determine acreage of wetland construction:**		
	Forested wetlands:		0.6679
	Tidal wetlands:		1.3359
	All other areas:		0.6679
3	**Wetland construction cost:**		
	Forested wetlands:		$59,587.23
	Tidal Wetlands:		$119,174.46
	All other areas:		$59,587.23
4	**Land acquisition cost (See land value table):**		
INSERT LAND VALUE FROM TABLE WHICH APPEARS TO THE LEFT. (Insert the amount do not copy and paste.)	Town land value:		5998.0
	Forested wetlands:		$4,006.31
	Tidal wetlands:		$8,012.62
	All other areas:		$4,006.31
5	**Construction + land costs:**		
	Forested wetland:		$63,593.54
	Tidal wetlands:		$127,187.08
	All other areas:		$63,593.54
6	**NHDES Administrative cost:**		
	Forested wetlands:		$12,718.71
	Tidal wetlands:		$25,437.42
	All other areas:		$12,718.71
**********	**TOTAL ARM PAYMENT************		
	Forested wetlands:		$76,312.25
	Tidal wetlands:		$152,624.49
	All other areas:		$76,312.25

Barnstead 14121 Mitigation Summary

NHDES AQUATIC RESOURCE MITIGATION FUND STREAM PAYMENT CALCULATION		
INSERT LINEAR FEET OF IMPACT on BOTH BANKS AND CHANNEL	Right Bank	151.00
	Left Bank	90.0000
	Channel	169.0000
	TOTAL IMPACT	410.0000
	Stream Impact Cost:	$84,624.00
	NHDES Administrative cost:	$16,924.80
*********	TOTAL ARM FUND STREAM PAYMENT********	$101,548.80

StreamStats Report, Sta.5074+50, Tier 2, Perrenial

Region ID:	NH
Workspace ID:	NH20190404124948724000
Clicked Point (Latitude, Longitude):	43.38673, -71.25082
Time:	2019-04-04 08:50:02 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.34	square miles
APRAVPRE	Mean April Precipitation	4.098	inches
WETLAND	Percentage of Wetlands	0.7366	percent
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	128	feet per mi

Peak-Flow Statistics Parameters [Peak Flow Statewide SIR2008 5206]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.34	square miles	0.7	1290
APRAVPRE	Mean April Precipitation	4.098	inches	2.79	6.23
WETLAND	Percent Wetlands	0.7366	percent	0	21.8
CSL10_85	Stream Slope 10 and 85 Method	128	feet per mi	5.43	543

Peak-Flow Statistics Disclaimers [Peak Flow Statewide SIR2008 5206]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Peak-Flow Statistics Flow Report [Peak Flow Statewide SIR2008 5206]

Statistic	Value	Unit
2 Year Peak Flood	19.9	ft^3/s
5 Year Peak Flood	36.3	ft^3/s
10 Year Peak Flood	51.2	ft^3/s
25 Year Peak Flood	72.8	ft^3/s
50 Year Peak Flood	91.4	ft^3/s
100 Year Peak Flood	114	ft^3/s

Statistic	Value	Unit
500 Year Peak Flood	174	ft^3/s

Peak-Flow Statistics Citations

Olson, S.A.,2009, Estimation of flood discharges at selected recurrence intervals for streams in New Hampshire: U.S.Geological Survey Scientific Investigations Report 2008-5206, 57 p. (http://pubs.usgs.gov/sir/2008/5206/)

Application Version: 4.3.0

NH Department of Transportation
Bureau of Highway Design
Barnstead, #14121
Sta. 5074+50, Tier 2, Perrenial

Env-Wt 904.07 In-Kind Replacement of Tier 1 or Tier 2 Existing Legal Crossings

- In order to qualify under this section, the crossing cannot have a history of causing or contributing to flooding that damages the crossing or other infrastructure. Does the crossing have a history of flooding? **No.**

- The replacement stream crossing shall be the same size and type as the existing OR an upgrade. Please describe how this applies to the subject project. **The replacement will be an upgrade. The existing 36" RC pipe will be replaced with twin 36" RC pipes. During construction, flow will be maintained in the existing pipe while the first 36" RC pipe is installed. Then flow will be maintained in the first 36" RC pipe while the second 36" RC pipe is installed.**
  The existing crossing has a drainage area of 218 acres, which is considered a Tier 2 stream crossing since the drainage area is greater than 200 and less than 640 acres.

If the above criteria do not apply to this project, the crossing does not qualify under this section and must be designed according to 904.02 (Tier 1 crossings) or 904.05 (Tier 2 crossings).

If the above criteria apply to this project, please provide the following information.

The project may qualify as a **minimum** impact project if:
The crossing does not diminish the hydraulic capacity of the crossing. **No**
The crossing does not diminish the capacity of the crossing to accommodate aquatic life passage. **No**
The crossing meets the general design criteria specified in Env-Wt 904.01, as follows:

Env-Wt 904.01
(a) Not be a barrier to sediment transport;
- The proposed work will not alter the stream crossing's sediment transport competence.

(b) Prevent the restriction of high flows and maintain existing low flows;
- With the increased cross sectional area, high flows will not be restricted following construction. In fact, high flows will be better accommodated following construction. Low flows will be maintained, and will not be diminished over existing conditions.

(c) Not obstruct or otherwise substantially disrupt the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction;
- The proposed work will not alter the stream crossing's ability to accommodate the movement of indigenous aquatic life beyond the duration of construction.

(d) Not cause an increase in the frequency of flooding or overtopping of banks;
- The culvert cross sectional area is being increased from the existing 36" RC pipe to twin 36" RC pipes, improving the overall capacity. The proposed design will provide improvements by reducing the frequency of flooding and possibility or overtopping of banks.

(e) Preserve watercourse connectivity where it currently exists;
- The proposed work will preserve the existing watercourse connectivity.

(f) Restore watercourse connectivity where: (1) Connectivity previously was disrupted as a result of human activity(ies); and (2) Restoration of connectivity will benefit aquatic life upstream or downstream of the crossing, or both;

- The roadway and original crossing were constructed in the 1920's. The proposed work will improve watercourse connectivity and will continue to support aquatic life upstream and downstream of the crossing.

(g) Not cause erosion, aggradation, or scouring upstream or downstream of the crossing; and

- The use of erosion control measures during construction, and the stabilization of disturbed areas, will ensure that there is no erosion, aggradation, or scour as a result of the proposed work. Stone fill will be placed at the inlet and outlet as erosion/stability protection.

(h) Not cause water quality degradation.

- The proposed crossing is not expected to cause water quality degradation in any way.

If the project does not qualify as a minimum impact project due to reasons stated above, it may qualify as a **minor** impact project if:

The crossing does not adversely impact the stability of the stream banks or stream bed upstream or downstream of the crossing.

- **Correct, stone fill will be placed at the inlet and outlet which will help with erosion and stability of the stream bed and stream banks.**

The crossing does not cause an increase in the frequency of flooding or overtopping of banks.

- **The culvert cross sectional area is being increased from the existing 36" RC pipe to twin 36" RC pipes, improving the overall capacity. The proposed design will provide improvements by reducing the frequency of flooding and possibility or overtopping of banks.**

If the project does not meet the above criteria for minimum OR minor, the crossing does not qualify under this section and must be designed according to 904.02 (Tier 1 crossings) or 904.05 (Tier 2 crossings).

StreamStats Report, Sta. 5086+50, Tier 1, Intermittent

Region ID:	NH
Workspace ID:	NH20190404125923758000
Clicked Point (Latitude, Longitude):	43.38824, -71.24827
Time:	2019-04-04 08:59:37 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.03	square miles
APRAVPRE	Mean April Precipitation	4.102	inches
WETLAND	Percentage of Wetlands	0	percent
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	204	feet per mi

Peak-Flow Statistics Parameters [Peak Flow Statewide SIR2008 5206]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.03	square miles	0.7	1290
APRAVPRE	Mean April Precipitation	4.102	inches	2.79	6.23
WETLAND	Percent Wetlands	0	percent	0	21.8
CSL10_85	Stream Slope 10 and 85 Method	204	feet per mi	5.43	543

Peak-Flow Statistics Disclaimers [Peak Flow Statewide SIR2008 5206]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Peak-Flow Statistics Flow Report [Peak Flow Statewide SIR2008 5206]

Statistic	Value	Unit
2 Year Peak Flood	2.23	ft^3/s
5 Year Peak Flood	4.39	ft^3/s
10 Year Peak Flood	6.44	ft^3/s
25 Year Peak Flood	9.6	ft^3/s
50 Year Peak Flood	12.4	ft^3/s
100 Year Peak Flood	16	ft^3/s

Statistic	Value	Unit
500 Year Peak Flood	25.8	ft^3/s

Peak-Flow Statistics Citations

Olson, S.A.,2009, Estimation of flood discharges at selected recurrence intervals for streams in New Hampshire: U.S.Geological Survey Scientific Investigations Report 2008-5206, 57 p. (http://pubs.usgs.gov/sir/2008/5206/)

Application Version: 4.3.0

NH Department of Transportation
Bureau of Highway Design
Barnstead, #14121
Sta. 5086+50, Tier 1, Intermittent

Env-Wt 904.07 In-Kind Replacement of Tier 1 or Tier 2 Existing Legal Crossings

- In order to qualify under this section, the crossing cannot have a history of causing or contributing to flooding that damages the crossing or other infrastructure. Does the crossing have a history of flooding? **No.**

- The replacement stream crossing shall be the same size and type as the existing OR an upgrade. Please describe how this applies to the subject project. **The replacement will be an upgrade. The existing 24" RC pipe will be replaced with a 30" plastic pipe.**
  The existing crossing has a drainage area of 20 acres, which is considered a Tier 1 stream crossing since the drainage area is less than 200 acres.

If the above criteria do not apply to this project, the crossing does not qualify under this section and must be designed according to 904.02 (Tier 1 crossings) or 904.05 (Tier 2 crossings).

If the above criteria apply to this project, please provide the following information.

The project may qualify as a **minimum** impact project if:
The crossing does not diminish the hydraulic capacity of the crossing. **No**
The crossing does not diminish the capacity of the crossing to accommodate aquatic life passage. **No**
The crossing meets the general design criteria specified in Env-Wt 904.01, as follows:

Env-Wt 904.01
(a) Not be a barrier to sediment transport;
- The proposed work will not alter the stream crossing's sediment transport competence.

(b) Prevent the restriction of high flows and maintain existing low flows;
- With the increased cross sectional area, high flows will not be restricted following construction. In fact, high flows will be better accommodated following construction. Low flows will be maintained, and will not be diminished over existing conditions.

(c) Not obstruct or otherwise substantially disrupt the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction;
- The proposed work will not alter the stream crossing's ability to accommodate the movement of indigenous aquatic life beyond the duration of construction.

(d) Not cause an increase in the frequency of flooding or overtopping of banks;
- The culvert cross sectional area is being increased from the existing 24" RC pipe to a 30" plastic pipe, improving the overall capacity. The proposed design will provide improvements by reducing the frequency of flooding and possibility or overtopping of banks.

(e) Preserve watercourse connectivity where it currently exists;
- The proposed work will preserve the existing watercourse connectivity. Since this is an intermittent stream, there are periods of the year when it has a dry watercourse.

(f) Restore watercourse connectivity where: (1) Connectivity previously was disrupted as a result of human activity(ies); and (2) Restoration of connectivity will benefit aquatic life upstream or downstream of the crossing, or both;

- The roadway and original crossing were constructed in the 1920's. The proposed work will maintain the existing watercourse connectivity, and continue to support the existing use by wildlife.

(g) Not cause erosion, aggradation, or scouring upstream or downstream of the crossing; and

- The use of erosion control measures during construction, and the stabilization of disturbed areas, will ensure that there is no erosion, aggradation, or scour as a result of the proposed work. Stone fill will be placed at the inlet and outlet as erosion/stability protection.

(h) Not cause water quality degradation.

- The proposed crossing is not expected to cause water quality degradation in any way. The upgraded pipe will provide a stable conduit for water to pass from higher elevation to lower.

If the project does not qualify as a minimum impact project due to reasons stated above, it may qualify as a **minor** impact project if:

The crossing does not adversely impact the stability of the stream banks or stream bed upstream or downstream of the crossing.

- **Correct, stone fill will be placed at the inlet and outlet which will help with erosion and stability of the stream bed and stream banks.**

The crossing does not cause an increase in the frequency of flooding or overtopping of banks.

- **The culvert cross sectional area is being increased from the existing 24" RC pipe to a 30" plastic pipe, improving the overall capacity. The proposed design will provide improvements by reducing the frequency of flooding and possibility or overtopping of banks.**

If the project does not meet the above criteria for minimum OR minor, the crossing does not qualify under this section and must be designed according to 904.02 (Tier 1 crossings) or 904.05 (Tier 2 crossings).

StreamStats Report, Sta. 5112+00, Tier 3, Perrenial

Region ID:	NH
Workspace ID:	NH20190404130429948000
Clicked Point (Latitude, Longitude):	43.39315, -71.24164
Time:	2019-04-04 09:04:43 -0400

Unnamed stream that flows into Half Moon Lake

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	1.1	square miles
APRAVPRE	Mean April Precipitation	4.13	inches
WETLAND	Percentage of Wetlands	1.0304	percent
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	125	feet per mi

Peak-Flow Statistics Parameters [Peak Flow Statewide SIR2008 5206]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.1	square miles	0.7	1290
APRAVPRE	Mean April Precipitation	4.13	inches	2.79	6.23
WETLAND	Percent Wetlands	1.0304	percent	0	21.8
CSL10_85	Stream Slope 10 and 85 Method	125	feet per mi	5.43	543

Peak-Flow Statistics Flow Report [Peak Flow Statewide SIR2008 5206]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	SEp	Equiv. Yrs.
2 Year Peak Flood	60.7	ft^3/s	36.9	99.8	30.1	3.2
5 Year Peak Flood	107	ft^3/s	64.2	179	31.1	4.7
10 Year Peak Flood	148	ft^3/s	86.9	253	32.3	6.2
25 Year Peak Flood	206	ft^3/s	117	364	34.3	8
50 Year Peak Flood	255	ft^3/s	140	464	36.4	9
100 Year Peak Flood	314	ft^3/s	167	594	38.6	9.8
500 Year Peak Flood	465	ft^3/s	226	955	44.1	11

Peak-Flow Statistics Citations

Olson, S.A.,2009, Estimation of flood discharges at selected recurrence intervals for streams in New Hampshire: U.S.Geological Survey Scientific Investigations Report 2008-5206, 57 p. (http://pubs.usgs.gov/sir/2008/5206/)

Application Version: 4.3.0

NH Department of Transportation
Bureau of Highway Design
Barnstead, #14121
Env-Wt 904.09 Alternative Design
TECHNICAL REPORT
Sta. 5112+00, Tier 3, Perrenial

Env-Wt 904.09(a) - If the applicant believes that installing the structure specified in the applicable rule is not practicable, the applicant may propose an alternative design in accordance with this section.

Please explain why the structure specified in the applicable rule is not practicable (Env-Wt 101.69 defines practicable as *available and capable of being done after taking into consideration costs, existing technology, and logistics in light of overall project purposes.)*

- Based on the field assessment performed in August 2017, the field bankfull width measurements (average of 8'), the recommended size for a fully compliant structure at this crossing is a 12 ft span structure. Constructing a 12 foot open span structure for this location was deemed outside the scope of this project and is not practicable.
- The proposed work involves the replacement of an existing 48" reinforced concrete (RC) pipe with inlet and outlet headwalls with twin 54" RC pipes and a 36" RC pipe and new headwalls. The existing 48" pipe carries an unnamed streams which outlets to Half Moon Lake. The existing crossing has a drainage area of 704 acres, which is considered a Tier 3 stream crossing since the drainage area is greater the 640 acres. The existing 48" pipe flooded around 2006 or 2007.
- The outlets of the twin 54" pipes will be lowered, so the new culvert will not be perched. The 36" pipe's invert will be 1 foot higher than the 54" pipe inverts to allow for wildlife passage as well as additional capacity during larger rain events.
- Since the proposed design is for a Tier 3 stream crossing, and will therefore not meet the requirements for replacement detailed in Env-Wt 904.04, the Department is pursuing an Alternative Design.

The proposed alternative meets the specific design criteria for Tier 2 and Tier 3 crossings to the *maximum extent practicable*, as specified below.

Env-Wt 904.05 Design Criteria for Tier 2 and Tier 3 Stream Crossings – New Tier 2 stream crossings, replacement Tier 2 crossings that do not meet the requirements of Env-Wt 904.07, and new and replacement Tier 3 crossings shall be designed and constructed:

(a) In accordance with the NH Stream Crossing Guidelines.

- The proposed work meets the intent of the NH Stream Crossing Guidelines to the maximum extent practicable, as discussed below. A compliant design is not proposed because replacement of the crossing, as required by Env-Wt 904.05, is beyond the scope of this project.

(b) With bed forms and streambed characteristics necessary to cause water depths and velocities within the crossing structure at a variety of flows to be comparable to those found in the natural channel upstream and downstream of the stream crossing.

- The outlets of the twin 54" pipes will be lowered, so the new culvert will not be perched. The proposed design increases capacity over the existing culvert and while minimizing the impacts to the stream.

(c) To provide a vegetated bank on both sides of the watercourse to allow for wildlife passage.

- The existing vegetated bank will remain in place, and any disturbed areas resulting from the proposed work will be stabilized and vegetation will be reestablished prior to the completion of construction. Vegetation will only be minimally impacted during construction and the vegetated riparian corridor will remain intact when the project is complete.

(d) To preserve the natural alignment and gradient of the stream channel, so as to accommodate natural flow regimes and the functioning of the natural floodplain.

- The existing crossing carries a low base flow during normal conditions. This flow regime, with depth similar to the natural channel, will be preserved through the culvert. The existing 48" RC pipe has a perched outlet. The proposed twin 54" RC pipes have been lowered so the culverts will not be perched, and a 36" RC pipe has been included for wildlife passage. The 36" pipe invert will have an invert one foot higher than the twin 54" RC pipes, to allow for the pipe to be dry during most conditions, as well as provide additional capacity during larger rain events.

(e) To accommodate the 100-year frequency flood, to ensure that (1) there is no increase in flood stages on abutting properties; and (2) flow and sediment transport characteristics will not be affected in a manner which could adversely affect channel stability.

- The culvert cross sectional area is being increased from the existing 48" RC pipe to twin 54" RC pipes, improving the overall capacity. The proposed twin 54" RC pipes will provide improvements over current flow by reducing the possibility of flooding or overtopping of banks, which will reduce the risk of flooding onto abutting properties. The twin 54" RC pipes will minimally alter flow and sediment transport competence from the existing condition.

(f) To simulate a natural stream channel.

- The existing 48" RC pipe is a closed bottom structure. The twin 54" RC pipes will also be a closed bottom structure. A natural open bottom streambed is not feasible with this project. Natural materials may settle in the pipe over time.

(g) So as not to alter sediment transport competence.

- The existing condition of the stream crossing will not change, so the crossing's resemblance to a natural stream channel will neither increase nor diminish.

Env-Wt 904.09(c)(3) – The alternative design must meet the general design criteria specified in Env-Wt 904.01:

Env-Wt 904.01
(a) Not be a barrier to sediment transport;

- The proposed work will not alter the stream crossing's sediment transport competence.

(b) Prevent the restriction of high flows and maintain existing low flows;

- With the increased cross sectional area, high flows will not be restricted following construction. In fact, high flows will be better accommodated following construction. Low flows will be maintained, and will not be diminished over existing conditions.

(c) Not obstruct or otherwise substantially disrupt the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction;

- The proposed work will not alter the stream crossing's ability to accommodate the movement of indigenous aquatic life beyond the duration of construction.

(d) Not cause an increase in the frequency of flooding or overtopping of banks;

- The culvert cross sectional area is being increased from the existing 48" RC pipe to twin 54" RC pipes, improving the overall capacity. In addition, a 36" RC pipe has been included for wildlife passage, which will provide extra capacity during larger rain events. The proposed design will provide improvements by reducing the frequency of flooding and the possibility or overtopping of banks.

(e) Preserve watercourse connectivity where it currently exists;

- The proposed work will improve watercourse connectivity by eliminating the perch at the outlet of the existing 48" RC pipe. The twin 54" pipe inverts have been lowered to eliminate the perched outlet.

(f) Restore watercourse connectivity where: (1) Connectivity previously was disrupted as a result of human activity(ies); and (2) Restoration of connectivity will benefit aquatic life upstream or downstream of the crossing, or both;

- The roadway and original crossing were constructed in the 1920's. The proposed work will improve watercourse connectivity and will benefit aquatic life upstream and downstream of the crossing.

(g) Not cause erosion, aggradation, or scouring upstream or downstream of the crossing; and

- The use of erosion control measures during construction, and the stabilization of disturbed areas, will ensure that there is no erosion, aggradation, or scour as a result of the proposed work. Stone fill will be placed at the inlet and outlet as erosion/stability protection.

(h) Not cause water quality degradation.

- The proposed crossing is not expected to cause water quality degradation in any way.

*****Note: An alternative design for <u>Tier 1</u> stream crossings must meet the general design criteria (Env-Wt 904.01) only to the *maximum extent practicable.***

CONFIDENTIAL – NH Dept. of Environmental Services review

Memo

NH Natural Heritage Bureau
NHB Datacheck Results Letter

To: Kerry Ryan, NHDOT
7 Hazen Drive
Concord, NH 03301

From: Amy Lamb, NH Natural Heritage Bureau
Date: 3/5/2019 (valid for one year from this date)
Re: Review by NH Natural Heritage Bureau
NHB File ID: NHB19-0705 Town: Barnstead Location: NH Route 28 (from 3500' south of North Rd intersection to 1700' north of North Rd.

Description: This project was originally submitted as NHB File ID: NHB15-3603. The project involves road improvements along NH Route 28 in Barnstead. The project will improve the profile in the vicinity of the NH Route 28/North Barnstead Road/North Road intersection. Other profile adjustments will be made along NH Route 28 in addition to minor adjustments to the side road approaches and the addition of narrow shoulders to NH Route 28. The profile adjustments may require minor realignment of NH Route 28 for construction control.

cc: Kim Tuttle

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments: There is a loon nest near the northern limits of the project. Please contact the NH Fish & Game Department.

Vertebrate species	State[1]	Federal	Notes
Common Loon (*Gavia immer*)	T	--	Contact the NH Fish & Game Dept (see below).

[1]Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

Contact for all animal reviews: Kim Tuttle, NH F&G, (603) 271-6544.

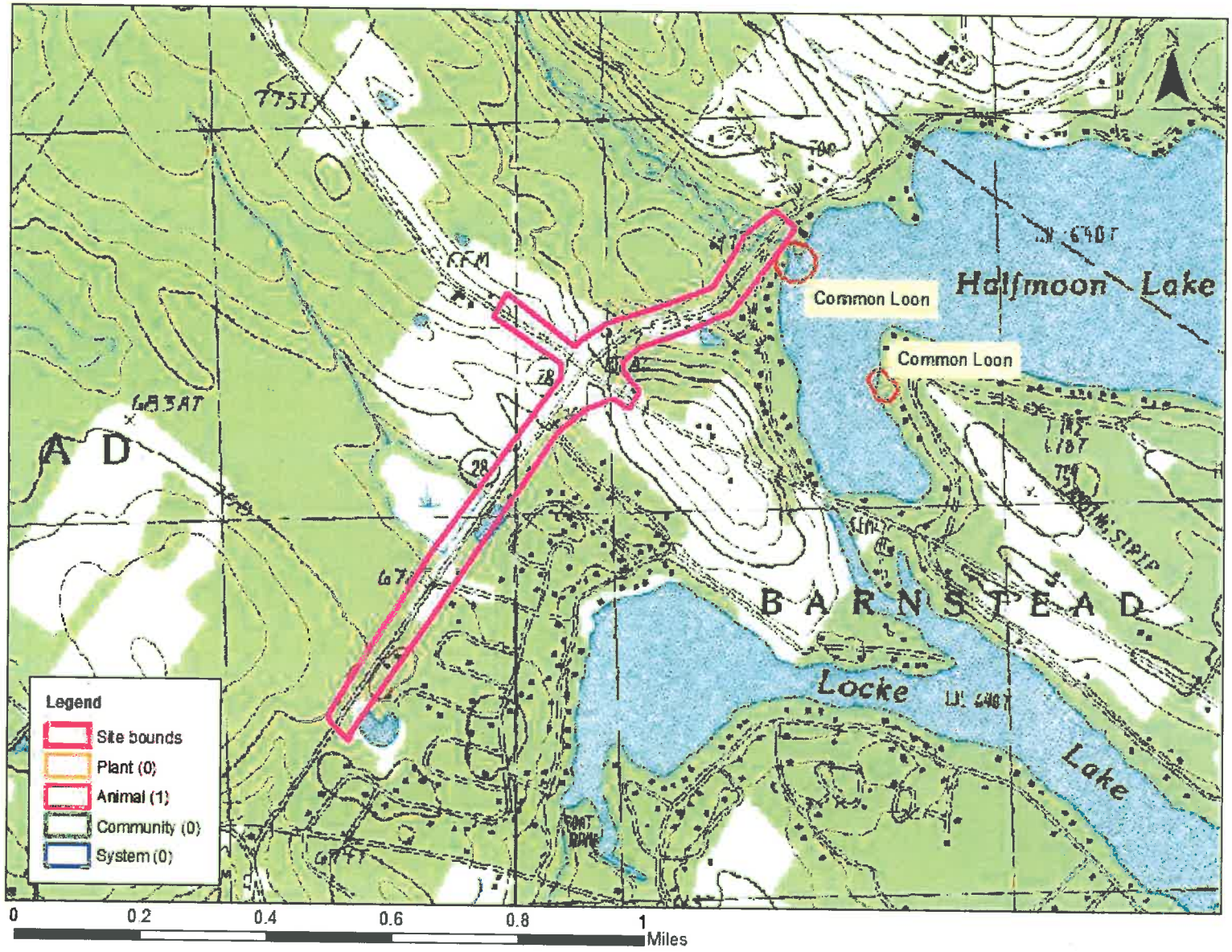
A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

CONFIDENTIAL – NH Dept. of Environmental Services review

NHB19-0705



New Hampshire Natural Heritage Bureau - Animal Record

Common Loon (*Gavia immer*)

Legal Status		Conservation Status	
Federal:	Not listed	Global:	Demonstrably widespread, abundant, and secure
State:	Listed Threatened	State:	Not ranked (need more information)

Description at this Location

Conservation Rank: Not ranked
Comments on Rank:

Detailed Description: 2017: Nest 7: 2 chicks hatched, 2 chicks survived.
2016: Nest 6: 2 chicks hatched, 1 chick survived.
2015: 1 pair, no nest.
2014: Nest 5: Nest and eggs present, no chicks hatched.
2013: 1 pair, no nest.
2012: Nest 4: Nest and eggs present, no chicks hatched.
2011: Nest 3: Nest and eggs present, no chicks hatched.
2010: 1 pair, no nest.
2009: Nest 1: Nest and eggs present, no chicks hatched. Nest 2: Nest and eggs present, no chicks hatched.

General Area:
General Comments: LPC territory NHT0538.
Management Comments:

Location

Survey Site Name: Halfmoon Lake
Managed By:

County: Belknap
Town(s): Alton
Size: 13.5 acres
Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions:

Dates documented

First reported: 2009 Last reported: 2017

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

CONFIDENTIAL – NH Dept. of Environmental Services review

Large, Sarah

From: Crickard, Ronald
Sent: Thursday, April 11, 2019 1:41 PM
To: Lyford, Donald; Bowles, James
Cc: Micucci, Stephanie; Nyhan, Kevin; Large, Sarah
Subject: FW: NHB19-0705 Barnstead NH Route 28 road improvements

Categories: Attention

Great news, there is No concerns with the Loon nesting area near the culvert crossing at the end of the project near Half Moon Lake.

From Kim Tuttle: *"I conferred with John Cooley, LPC Senior Loon Biologist about the project; it looks like the loons are not nesting at the Rt.28 end of Half Moon Lake any longer."*

"The NHFG Nongame and Endangered Wildlife Program concurs with the findings of John Cooley and we do not expect disturbance impacts to nesting common loon from construction activities for the Barnstead NH Route 28 road improvements."

Let me know if you have any further questions.
Ron

Ronald Crickard
Chief, Project Management
NH Department of Transportation
Bureau of Environment
7 Hazen Drive, Concord, NH 03302
Ph: (603) 271-7966
Fax: (603) 271-7199
Ronald.Crickard@dot.nh.gov

From: Tuttle, Kim
Sent: Thursday, April 11, 2019 1:18 PM
To: Crickard, Ronald
Subject: RE: NHB19-0705 Barnstead NH Route 28 road improvements

Halfmoon-Alte...

Ron,

I conferred with John Cooley, LPC Senior Loon Biologist about the project; it looks like the loons are not nesting at the Rt.28 end of Half Moon Lake any longer.

From John:
"So, as long as the project is following best practices to protect water quality, which I imagine will be pretty standard with this kind of work, I don't think there are concerns about loon nest site disturbance because the active nest now is down at the E end of the lake, where a nest raft has been used by the loons for the past 3 years, with success (so the loons are likely to stick with that location). The various sites at the W end of the lake near the road work were individual nest attempts by the loons as they tried and failed to hatch, in the years leading up to the provision of the nest raft (2016, I think). I'm attaching a map that shows the year with the pushpins, raft area circled in red."

The NHFG Nongame and Endangered Wildlife Program concurs with the findings of John Cooley and we do not expect disturbance impacts to nesting common loon from construction activities for the Barnstead NH Route 28 road improvements.

Regards,

Kim Tuttle
Wildlife Biologist
NH Fish and Game
11 Hazen Drive
Concord, NH 03301
603-271-6544

From: Crickard, Ronald
Sent: Wednesday, April 10, 2019 12:15 PM
To: Tuttle, Kim
Subject: RE: NHB19-0705 Barnstead NH Route 28 road improvements

Thank you, we'll let you know what kind of matting we use.

Ron

From: Tuttle, Kim
Sent: Wednesday, April 10, 2019 11:35 AM
To: Crickard, Ronald
Cc: Large, Sarah; jcooley@loon.org
Subject: RE: NHB19-0705 Barnstead NH Route 28 road improvements

Hi Ron,

It's mostly the construction noise that could cause nest abandonment here. I have cc'd John Cooley and will send him the job info to get his opinion on this one. Let us know what kind of erosion control matting you want to use so we can okay it or not.

Kim Tuttle
Wildlife Biologist

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To:
Consultation Code: 05E1NE00-2017-SLI-0901
Event Code: 05E1NE00-2019-E-03304
Project Name: NH Route 28 Reconstruction, Barnstead 14121

April 11, 2019

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2017-SLI-0901

Event Code: 05E1NE00-2019-E-03304

Project Name: NH Route 28 Reconstruction, Barnstead 14121

Project Type: TRANSPORTATION

Project Description: The project involves road improvements along NH Route 28 in Barnstead. The project will improve the profile in the vicinity of the NH Route 28/ North Barnstead Road/North Road intersection. Other profile adjustments will be made along NH Route 28 in addition to minor adjustments to the side road approaches and the addition of narrow shoulders to NH Route 28. The profile adjustments may require minor realignment of NH Route 28 for construction traffic control.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/43.3876275251921N71.24989255146724W

Counties: Belknap, NH

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Flowering Plants

NAME	STATUS
Small Whorled Pogonia *Isotria medeoloides* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1890	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5087
http://www.fws.gov/newengland

RE: NH Route 28 Improvements
Barnstead, New Hampshire (05E1NE00-2017-F-0901)

April 6, 2017

Rebecca Martin
NH DOT Bureau of Environment
7 Hazen Drive
Concord, NH 03301

Dear Ms. Martin:

The U.S. Fish and Wildlife Service (Service) is responding to your March 7, 2017 request, and Project Submittal Form to verify that the proposed improvements to NH Route 28 in Barnstead, New Hampshire (Project) may rely on the May 20, 2016 Programmatic Biological Opinion (BO) for federally funded or approved transportation projects that may affect the northern long-eared bat (NLEB) (*Myotis septentrionalis*). This letter provides the Service's response as to whether the Project may rely on the BO to comply with section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) for its effects to the NLEB.

The New Hampshire Department of Transportation (NHDOT) Project will include widening Route 28 and adding a 4-foot shoulder for approximately 1 mile. The vertical alignment will be adjusted, including lowering the road crest and raising a low area near the intersection of Route 28 and North Barnstead Road and North Road. The construction will require approximately 2.73 acres of tree clearing. NHDOT, as the non-Federal agency representative for the Federal Highway Administration, determined that the Project is *likely to adversely affect* the NLEB, because the proposed action may affect trees potentially occupied by the NLEB during the active season. NHDOT also determined the Project may rely on the programmatic BO to comply with section 7(a)(2) of the ESA, because the Project meets the conditions outlined in the BO, all tree clearing related to the proposed roadwork will occur farther than 0.25 mile from documented roosts, and farther than 0.5 mile from any hibernacula. The Service reviewed the Project Submittal Form and concurs with NHDOT's determination. This concurrence concludes your ESA section 7 responsibilities relative to this species for this Project, subject to the Reinitiation Notice below.

Conclusion

The Service has reviewed the effects of the proposed Project, which includes NHDOT's commitment to implement the impact avoidance, minimization, and compensation measures as indicated on the Project Submittal Form. We confirm that the proposed Project's effects are consistent with those analyzed in the BO. The Service has determined that the Project is consistent with the BO's conservation measures, and the scope of the program analyzed in the BO is not likely to jeopardize the continued existence of the NLEB. In coordination with your agency, the Federal Highway Administration, and the other sponsoring Federal Transportation Agencies, the Service will reevaluate this conclusion annually in light of any new pertinent information under the adaptive management provisions of the BO.

Incidental Take of the Northern Long-eared Bat

The Service anticipates that tree removal associated with the proposed Project will cause incidental take of the NLEB. However, the Project is consistent with the BO, and such projects will not cause take of the NLEB that is prohibited under the final 4(d) rule for this species (50 CFR §17.40(o)). Therefore, this taking does not require exemption from the Service.

Reporting Dead or Injured Bats

NHDOT, the Federal Highway Administration, its State/local cooperators, and any contractors must take care when handling dead or injured NLEBs that are found at the project site in order to preserve biological material in the best possible condition and to protect the handler from exposure to diseases, such as rabies. Project personnel are responsible for ensuring that any evidence about determining the cause of death or injury is not unnecessarily disturbed. Reporting the discovery of dead or injured listed species is required in all cases to enable the Service to determine whether the level of incidental take exempted by this BO is exceeded, and to ensure that the terms and conditions are appropriate and effective. Parties finding a dead, injured, or sick specimen of any endangered or threatened species must promptly notify the Service's New England Field Office.

Reinitiation Notice

This letter concludes consultation for the proposed Project, which qualifies for inclusion in the BO issued to the Federal Transportation Agencies. To maintain this inclusion, a reinitiation of this project-level consultation is required where the Federal Highway Administration's discretionary involvement or control over the Project has been retained (or is authorized by law) and if:

1. new information reveals that the Project may affect listed species or critical habitat in a manner or to an extent not considered in the BO;
2. the Project is subsequently modified in a manner that causes an effect to listed species or designated critical habitat not considered in the BO; or
3. a new species is listed or critical habitat designated that the Project may affect.

In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

We appreciate your continued efforts to ensure that this Project is fully consistent with all applicable provisions of the BO. If you have any questions regarding our response, or if you need additional information, please contact Susi von Oettingen of this office at 603-227-6418.

Sincerely yours,

Thomas R. Chapman
Supervisor
New England Field Office

New Hampshire DOT
Department of Transportation

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

Victoria F. Sheehan
Commissioner

William Cass, P.E.
Assistant Commissioner

BARNSTEAD
X-A000(208)
14121
RPR 7490

No Historic Properties Affected Memo

Pursuant to the meeting and discussions on May 12, 2016 and subsequent correspondence, and for the purpose of compliance with regulations of the National Historic Preservation Act and the Advisory Council on Historic Preservation's *Procedures for the Protection of Historic Properties* (36 CFR 800), the NH Division of Historical Resources (NHDHR) and the NH Division of the Federal Highway Administration (FHWA) have coordinated the identification and evaluation of historical and archaeological resources with plans to improve NH Route 28, including the intersection with North Road and North Barnstead Road in the Town of Barnstead, New Hampshire.

Project plans include reconstructing the intersection of NH Route 28, North Road, and North Barnstead Road, and widening a segment of Route 28 to improve safety. The proposed reconstruction of Route 28 will begin approximately 3,400' south of North Road and North Barnstead Road and extend north approximately 5,400'. The improvements to North Barnstead Road will extend approximately 200' east of Route 28, and the improvements to North Road will extend approximately 500' west of Route 28.

Based on a review pursuant to 36 CFR 800.4, we agree that no historic or archaeological resources are affected in the project area and that no further survey work is needed. Phase IB archaeological investigations, which occurred along the project area, did not locate archaeological resources. The circa 1806 farmstead located at 44 North Road was inventoried and determined not eligible for the National Register of Historic Places. The area was reviewed for a potential agricultural historic district; it was determined that the area east of NH Route 28 has substantial development starting in the late 1970s and early 1980s. The area west of NH Route 28 has remained fairly undisturbed with the exception of farmlands becoming forested. The proposed undertaking will address the steep slopes along NH Route 28 and North Road and keep as much open field as possible; this will impact approximately 1.43 acres of the 31.28 acres of farmland currently adjacent to the roadway work. There will be no physical destruction to the agricultural land as we are keeping as much open field as possible and primarily impacting the existing slopes. There will be no detrimental impacts to the agricultural land through the slope stabilization, and the use and character of the property will not change as it will remain in agricultural use. The roadway improvements will not introduce visual, atmospheric or audible elements that could diminish the agricultural lands as the roadway and traffic are currently present. Because the intersection improvement project proposed at NH Route 28 and North Road does not have the potential to impact the farm and forested lands that are located west of the area, there are no historic concerns.

Section 4(f) *(to be completed by FHWA)*	*There Will Be:*	☒ No 4(f);	☐ Programmatic 4(f);	☐ Full 4 (f); or
	☐ **A finding of *de minimis* 4(f) impact as stated:** In addition, with NHDHR concurrence of no adverse effect for the above undertaking, and in accordance with 23 CFR 774.3, FHWA intends to, and by signature below, does make a finding of *de minimis* impact. NHDHR's signature represents concurrence with both the no adverse effect determination and the *de minimis* findings. Parties to the Section 106 process have been consulted and their concerns have been taken into account. Therefore, the requirements of Section 4(f) have been satisfied.			

In accordance with the Advisory Council's regulations, we will continue to consult, as appropriate, as this project proceeds.

9/16/16

Patrick Bauer, Administrator
Federal Highway Administration

Date

9/16/16

Jill Edelmann
Cultural Resources Manager

Date

Concurred with by the NH State Historic Preservation Officer:

Elizabeth H. Muzzey
State Historic Preservation Officer
NH Division of Historical Resources

Date

c.c. Chris St. Louis, NHDHR
Jamie Sikora, FHWA
Ron Crickard, DOT
Don Lyford, DOT

S:\Environment\CULTURAL\MEMOS\CURRENT\NoHistoricPropertiesAffectedFHWA.doc

US Army Corps of Engineers ®
New England District

Appendix B

Regional General Permits (GPs)
Required Information and Corps Secondary Impacts Checklist

In order for the Corps of Engineers to properly evaluate your application, applicants must submit the following information along with the New Hampshire DES Wetlands Bureau application or permit notification forms. Some projects may require more information. For a more comprehensive checklist, go to www.nae.usace.army.mil/regulatory, "Forms/Publications" and then "Application and Plan Guideline Checklist." Check with the Corps at (978) 318-8832 for project-specific requirements. For your convenience, this Appendix B is also attached to the State of New Hampshire DES Wetlands Bureau application and Permit by Notification forms.

All Projects:

- Corps application form (ENG Form 4345) as appropriate.
- Photographs of wetland/waterway to be impacted.
- Purpose of the project.
- Legible, reproducible black and white (no color) plans no larger than 11"x17" with bar scale. Provide locus map and plan views of the entire property.
- Typical cross-section views of all wetland and waterway fill areas and wetland replication areas.
- In navigable waters, show mean low water (MLW) and mean high water (MHW) elevations. Show the high tide line (HTL) elevations when fill is involved. In other waters, show ordinary high water (OHW) elevation.
- On each plan, show the following for the project:
- Vertical datum and the NAVD 1988 equivalent with the vertical units as U.S. feet. Don't use local datum. In coastal waters this may be mean higher high water (MHHW), mean high water (MHW), mean low water (MLW), mean lower low water (MLLW) or other tidal datum with the vertical units as U.S. feet. MLLW and MHHW are preferred. Provide the correction factor detailing how the vertical datum (e.g., MLLW) was derived using the latest National Tidal Datum Epoch for that area, typically 1983-2001.
- Horizontal state plane coordinates in U.S. survey feet based on the Traverse Mercator Grid system for the State of New Hampshire (Zone 2800) NAD 83.
- Show project limits with existing and proposed conditions.
- Limits of any Federal Navigation Project in the vicinity of the project area and horizontal State Plane Coordinates in U.S. survey feet for the limits of the proposed work closest to the Federal Navigation Project;
- Volume, type, and source of fill material to be discharged into waters and wetlands, including the area(s) (in square feet or acres) of fill in wetlands, below the ordinary high water in inland waters and below the high tide line in coastal waters.
- Delineation of all waterways and wetlands on the project site,:
- Use Federal delineation methods and include Corps wetland delineation data sheets. See GC 2 and www.nero.noaa.gov/hcd for eelgrass survey guidance.
- GP 3, Moorings, contains eelgrass survey requirements for the placement of moorings.
- For activities involving discharges of dredged or fill material into waters of the U.S., include a statement describing how impacts to waters of the U.S. are to be avoided and minimized, and either a statement describing how impacts to waters of the U.S. are to be compensated for (or a conceptual or detailed mitigation plan) or a statement explaining why compensatory mitigation should not be required for the proposed impacts. Please contact the Corps for guidance.

US Army Corps of Engineers®
New England District

New Hampshire General Permits (GPs)
Appendix B - Corps Secondary Impacts Checklist
(for inland wetland/waterway fill projects in New Hampshire)

1. Attach any explanations to this checklist. Lack of information could delay a Corps permit determination.
2. All references to "work" include all work associated with the project construction and operation. Work includes filling, clearing, flooding, draining, excavation, dozing, stumping, etc.
3. See GC 5, regarding single and complete projects.
4. Contact the Corps at (978) 318-8832 with any questions.

1. Impaired Waters	Yes	No
1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water? See http://des.nh.gov/organization/divisions/water/wmb/section401/impaired_waters.htm to determine if there is an impaired water in the vicinity of your work area.*	X	
2. Wetlands	Yes	No
2.1 Are there are streams, brooks, rivers, ponds, or lakes within 200 feet of any proposed work?	X	
2.2 Are there proposed impacts to SAS, special wetlands. Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) DataCheck Tool for information about resources located on the property at https://www2.des.state.nh.us/nhb_datacheck/. The book Natural Community Systems of New Hampshire also contains specific information about the natural communities found in NH.		X
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?	X	
2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)	X	
2.5 The overall project site is more than 40 acres?		X
2.6 What is the area of the previously filled wetlands?	Unknown	
2.7 What is the area of the proposed fill in wetlands?	21,550 SF	
2.8 What is the % of previously and proposed fill in wetlands to the overall project site?	N/A	
3. Wildlife	Yes	No
3.1 Has the NHB & USFWS determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project? (All projects require an NHB ID number & a USFWS IPAC determination.) NHB DataCheck Tool: https://www2.des.state.nh.us/nhb_datacheck/ USFWS IPAC website: https://ecos.fws.gov/ipac/location/index	X	

3.2 Would work occur in any area identified as either "Highest Ranked Habitat in N.H." or "Highest Ranked Habitat in Ecological Region"? (These areas are colored magenta and green, respectively, on NH Fish and Game's map, "2010 Highest Ranked Wildlife Habitat by Ecological Condition.") Map information can be found at: • PDF: www.wildlife.state.nh.us/Wildlife/Wildlife_Plan/highest_ranking_habitat.htm. • Data Mapper: www.granit.unh.edu. • GIS: www.granit.unh.edu/data/downloadfreedata/category/databycategory.html.		X
3.3 Would the project impact more than 20 acres of an undeveloped land block (upland, wetland/waterway) on the entire project site and/or on an adjoining property(s)?		X
3.4 Does the project propose more than a 10-lot residential subdivision, or a commercial or industrial development?		X
3.5 Are stream crossings designed in accordance with the GC 21?	X	
4. Flooding/Floodplain Values	Yes	No
4.1 Is the proposed project within the 100-year floodplain of an adjacent river or stream?		X
4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage?	N/A	N/A
5. Historic/Archaeological Resources		
For a minimum, minor or major impact project - a copy of the Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) with your DES file number shall be sent to the NH Division of Historical Resources as required on Page 11 GC 8(d) of the GP document**	X	

*Although this checklist utilizes state information, its submittal to the Corps is a Federal requirement.
** If your project is not within Federal jurisdiction, coordination with NH DHR is not required under Federal law.

Barnstead 14121 **Photos**

Location: STA 5074+40

This is a tier 2 stream crossing with an existing 36" RCP. Proposed work includes installing 2-36" RCP's. It is a perennial stream with a drainage area of approximately 218 acres. The wetlands being impacted are identified as #'s 10, 11, 13, and 14 on the plans.

Inlet:

Facing Upstream: Representative photo of PEM1D & PSS1E wetlands.

Outlet:

Facing Downstream

Location: STA 5086+60

This is a Tier 1 stream crossing with an existing 24" RCP. Proposed work includes installing a 30" RCP. It is an intermittent stream with a drainage area of approximately 20 acres. The wetlands being impacted are identified as #'s 17, 18, and 19 on the plans.

Inlet:

Outlet:

Location: STA 5100+50

This is a wetland crossing with an existing 30" RCP. Proposed work includes installing 30" Plastic Pipe. The inlet side is a PFO1E and the outlet is a PEM1E wetlands. The wetlands being impacted are identified as #'s 26 and 25 on the plans.

Inlet:

Outlet:

Location: STA 5112+00

This is a Tier 3 stream crossing with an existing 48" RCP. Proposed work includes installing 2-54" RCP's and a 36" RCP for critter crossing. It is a perennial stream with a drainage area of approximately 704 acres. The wetlands being impacted are #'s 28, 29, 30, 31, 32, and 33 on the plans.

Inlet:

Facing Upstream

Outlet:

Facing Downstream

Barnstead 14121
Wetlands Permit – Construction Sequence

May 8, 2019

Anticipated Project Start: April 2020
Anticipated Project Completion: July 2021

CONSTRUCTION SEQUENCING

1. Complete any work required to facilitate the utility relocations as priority work.
2. Clear trees and brush as necessary for the entire project.
3. Install perimeter/erosion control for the entire project

Drainage Work

4. Install drainage cross pipes and culverts, including inlet/outlet stone aprons, use clean water bypasses as needed.

    a. Three stream crossings will be replaced: Sta. 5074+50, existing 36"RC pipe replaced with twin 36" RC pipes; Sta. 5086+50, existing 24"RC pipe replaced with a 30 RC pipe; Sta. 5112+00, existing 48" RC pipe replaced with twin 54" RC pipes and a 36" RC pipes (wildlife friendly).

        a.1. Sta. 5074+50 – Perrenial Stream, existing 36" RC pipe is replaced with twin 36" RC pipes. During the installation of the first 36" RC pipe, flow will be maintained through the existing 36" RC pipe. During the installation of the second 36" RC pipe, flow will be maintained through the first 36" RC pipe.

        a.2. Sta. 5086+50 – Intermittent Stream, existing 24" RC pipe is replaced with a 30" RC pipe. If low flow is encountered during construction, a clean water bypass will be required. A temporary pipe could be installed or the water could be dammed up and pumped.

        a.3. Sta. 5112+00 – Perennial Streams. existing 48" RC pipe is replaced with twin 54" RC pipes and a 36" RC pipe (wildlife friendly). During the installation of the first 54" RC pipe and 36" RC pipe (wildlife friendly), flow will be maintained through the existing 48" RC pipe. During the installation of the second 54" RC pipe, flow will be maintained through the first 54" RC pipe.

5. Construct paved trench patches for all pipe trenching related to drainage.
6. Permanently stabilize all slope work associated with the drainage.
7. Shallow underdrains will be installed first, starting at the outlet.
8. Construct treatment swales (6) and stabilize prior to directing flow to the swale.

Roadway Box Work

9. The project will be worked on in segments. Each segment will need to be completed before the Contractor moves onto the next segment. Within each segment, apply the following constraints:
    a. Construct full box for one lane and the shoulder one side at a time, next construct the full box for the other lane and shoulder. This step will be followed until a segment is completed.
    b. Perform fine grading and complete all paving.
    c. Permanently stabilize all slope work associated with the roadway box widening and slope tie-ins.

Deep Cut Area Work (North Road/North Barnstead Road intersection)

10. Starting near the North Road/North Barnstead Road intersection, lower the roadway in increments a few feet at a time, by shifting traffic from side to side while maintaining two lanes of traffic on crushed gravel.

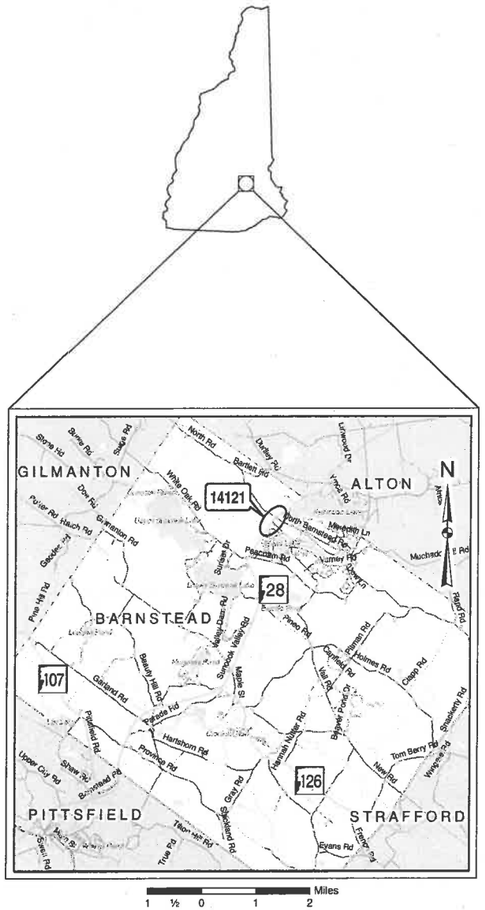
11. After the roadway has been lowered to the point that two lanes of traffic can no longer be maintained, the Contractor shall maintain one lane of two way traffic during work hours and return traffic to two lanes of two-way traffic on crushed gravel at the end of each work day.

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

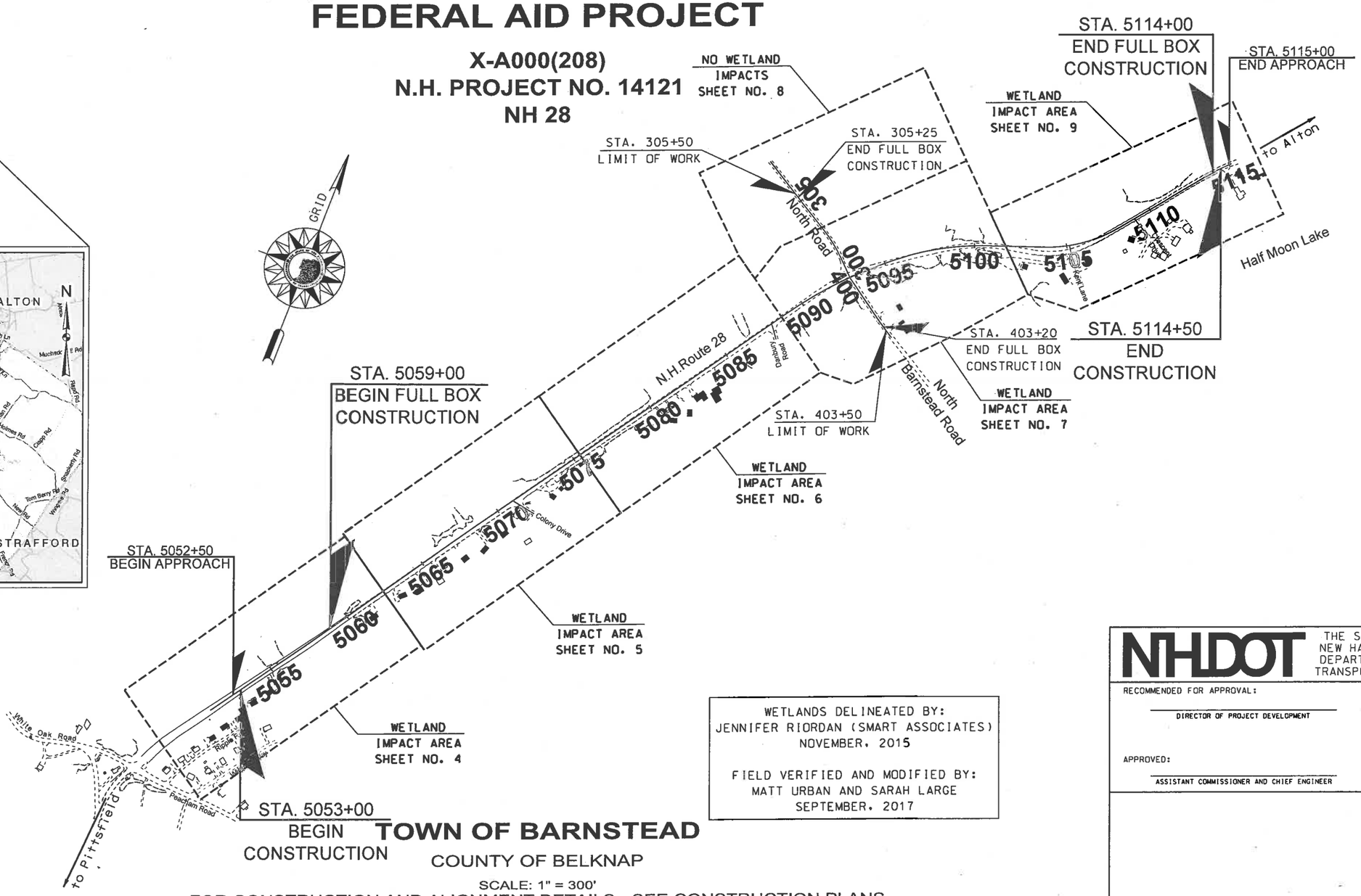
WETLANDS PLANS
FEDERAL AID PROJECT

X-A000(208)
N.H. PROJECT NO. 14121
NH 28

DESIGN DATA	
AVERAGE DAILY TRAFFIC 20 17	6650
AVERAGE DAILY TRAFFIC 20 37	8110
PERCENT OF TRUCKS	8.4%
DESIGN SPEED	50 MPH
LENGTH OF PROJECT	±1.2 MI



LOCATION MAP



INDEX OF SHEETS

WETLANDS DELINEATED BY:
JENNIFER RIORDAN (SMART ASSOCIATES)
NOVEMBER, 2015

FIELD VERIFIED AND MODIFIED BY:
MATT URBAN AND SARAH LARGE
SEPTEMBER, 2017

TOWN OF BARNSTEAD
COUNTY OF BELKNAP

SCALE: 1" = 300'

FOR CONSTRUCTION AND ALIGNMENT DETAILS - SEE CONSTRUCTION PLANS

NHDOT THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

RECOMMENDED FOR APPROVAL:

DIRECTOR OF PROJECT DEVELOPMENT — DATE

APPROVED:

ASSISTANT COMMISSIONER AND CHIEF ENGINEER — DATE

FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
	14121	1	16

DRAWN BY JDL — DATE 01/2019
CHECKED BY AMC — DATE 03/2019

GENERAL

EDGE OF PAVEMENT
TRAVELED WAY

PROPOSED ROADWAY | existing roadway | (pavement removed outside slope lines)

DRIVEWAYS

(label surface type)

BUILDINGS

(building to be removed)

(label house or type of building)

FOUNDATION

(label type)

LEACH FIELD

leach field

BRIDGE CROSSINGS

STREAM | OVERPASS

STEPS AND WALK

(label type)

INTERMITTENT WATER COURSE

SHORE LINE

river/stream | pond | (label name of water body)

POTENTIAL WET AREA SYMBOL

BRUSH OR WOODS LINE

TREES (PLANS)

(deciduous) (coniferous) (stump)

TREE OR STUMP (CROSS-SECTIONS)

(show station, circumference in feet & type)

HEDGE

(label type)

MONITORING WELL

mon

WELL

FLAG POLE

fp

ORIGINAL GROUND (TYPICALS)

ROCK OUTCROP

ROCK LINE (TYPICALS & SECTIONS ONLY)

existing | PROPOSED

GUARDRAIL (label type)

bgr
cgr

JERSEY BARRIER

CURB (LABEL TYPE)

STONE WALL

RETAINING WALL (LABEL TYPE)

(points toward retained ground)

FENCE (LABEL TYPE)

SIGNS

(single post)
(double post)

GAS PUMP

gp

FUEL TANK (ABOVE GROUND)

ft (label size & type)

STORAGE TANK FILLER CAP

fc

SEPTIC TANK

S

GRAVE

gr

MAILBOX

mb

VENT PIPE

vp

SATELLITE DISH ANTENNA

da

PHONE

ph

GROUND LIGHT/LAMP POST

gl lp

BORING LOCATION

B

TEST PIT

TP

INTERSTATE NUMBERED HIGHWAY

293

UNITED STATES NUMBERED HIGHWAY

3

STATE NUMBERED HIGHWAY

102

SHORELAND - WETLAND

WETLAND DESIGNATION AND TYPE

2
PUB2E

DELINEATED WETLAND
ORDINARY HIGH WATER
TOP OF BANK
TOP OF BANK & ORDINARY HIGH WATER
NORMAL HIGH WATER
WIDTH AT BANK FULL
PRIME WETLAND
PRIME WETLAND 100' BUFFER
NON-JURISDICTIONAL DRAINAGE AREA
COWARDIN DISTINCTION LINE
TIDAL BUFFER ZONE
DEVELOPED TIDAL BUFFER ZONE
HIGHEST OBSERVABLE TIDE LINE
MEAN HIGH WATER
MEAN LOW WATER
VERNAL POOL
SPECIAL AQUATIC SITE
REFERENCE LINE
WATER FRONT BUFFER
NATURAL WOODLAND BUFFER
PROTECTED SHORELAND
INVASIVE SPECIES LABEL

I.S. I | I.S. II

INVASIVE SPECIES

FLOODPLAIN / FLOODWAY

500 YEAR FLOODPLAIN BOUNDARY
100 YEAR FLOODPLAIN BOUNDARY
FLOODWAY

ENGINEERING

CONSTRUCTION BASELINE

30 31 32

PC. PT. POT (ON CONST BASELINE)

PI (IN CONSTRUCTION BASELINES)

INTERSECTION OR EQUATION OF TWO LINES

ORIGINAL GROUND LINE (PROFILES AND CROSS-SECTIONS)

PROFILE GRADE LINE (PROFILES AND CROSS-SECTIONS)

SLOPE LINE | CLEARING LINE

CLEARING LINE
SLOPE LINE
SLOPE LINE (FILL)
SLOPE LINE (CUT)

PROFILES AND CROSS SECTIONS:
ORIGINAL GROUND ELEVATION (LEFT) 72.5
FINISHED GRADE ELEVATION (RIGHT) 79.14

STATE OF NEW HAMPSHIRE
BARNSTEAD
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

STANDARD SYMBOLS

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
11-21-2014	14121stdsymb1_2	14121	2	16

DRAINAGE

MANHOLE

CATCH BASIN — cb

DROP INLET — di

(existing) / (PROPOSED)

DRAINAGE PIPE (existing) — (label size & type)

DRAINAGE PIPE (PROPOSED)

UNDERDRAIN (existing) W/ FLUSHING BASIN

UNDERDRAIN (PROPOSED) W/ FLUSHING BASIN — fb — (label size & type)

show direction of flow

HEADER (existing & PROPOSED) — (with stone outlet protection)

END SECTION (existing & PROPOSED) — METAL or PLASTIC / RCP

OPEN DITCH (PROPOSED)

EROSION CONTROL / STONE SLOPE PROTECTION

BOUNDARIES / RIGHT-OF-WAY

RIGHT-OF-WAY LINE — (label type)

RR RIGHT-OF-WAY LINE

PROPERTY LINE — R

PROPERTY LINE (COMMON OWNER) — Z

TOWN LINE — BOW / CONCORD

COUNTY LINE — COOS / GRAFTON

STATE LINE — MAINE / NEW HAMPSHIRE

NATIONAL FOREST

CONSERVATION LAND — LC

BENCH MARK / SURVEY DISK

BOUND — bnd (PROPOSED)

STATE LINE / TOWN LINE MONUMENT — S/L — T/L

NHDOT PROJECT MARKER

IRON PIPE OR PIN — ip

DRILL HOLE IN ROCK — dh

TAX MAP AND LOT NUMBER — 156 / 14 — 1642/341 — 6.80 Ac.±

PROPERTY PARCEL NUMBER — 12

HISTORIC PROPERTY — H

UTILITIES

existing / PROPOSED

TELEPHONE POLE

POWER POLE

JOINT OCCUPANCY

MISCELLANEOUS/UNKNOWN POLE

GUY POLE OR PUSH BRACE

(plot point at face not center of symbol)

LIGHT POLE

LIGHT ON POWER POLE

LIGHT ON JOINT POLE

POLE STATUS:
REMOVE, LEAVE, PROPOSED, OR TEMPORARY AS APPLICABLE e.g.:

R / L — P+04 25.0' — T+04 25.0'

RAILROAD — (label ownership)

RAILROAD SIGN

RAILROAD SIGNAL

UTILITY JUNCTION BOX — jb — JB

OVERHEAD WIRE — OW — (label type)

UNDERGROUND UTILITIES

WATER (on existing lines label size, type and note if abandoned) — W — PW

SEWER — S — PS

TELEPHONE — T — PT

ELECTRIC — E — PE

GAS — G — PG

LIGHTING — L — PL

INTELLIGENT TRANSPORTATION SYSTEM — ITS — PITS

FIBER OPTIC — FO — PFO

WATER SHUT OFF

GAS SHUT OFF

HYDRANT

MANHOLES

SEWER — MHS

TELEPHONE — MHT

ELECTRICAL — MHE

GAS — MHG

UNKNOWN

TRAFFIC SIGNALS / ITS

existing / PROPOSED

MAST ARM (existing) — 30' MA (NOTE ANGLE FROM ℄)

OPTICOM RECEIVER

OPTICOM STROBE

TRAFFIC SIGNAL

PEDESTAL WITH PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON UNIT

SIGNAL CONDUIT — C — PC

CONTROLLER CABINET — cc — CC

METER PEDESTAL — mp — MP

PULL BOX — pb — PB

LOOP DETECTOR (QUADRUPOLE) — (label size)

LOOP DETECTOR (RECTANGULAR) — (label size)

CAMERA POLE (CCTV)

FIBER OPTIC DELINEATOR — fod — FOD

FIBER OPTIC SPLICE VAULT — SVF

ITS EQUIPMENT CABINET — its — ITS

VARIABLE SPEED LIMIT SIGN

DYNAMIC MESSAGE SIGN

ROAD AND WEATHER INFO SYSTEM

CONSTRUCTION NOTES

CURB MARK NUMBER - BITUMINOUS	B-1
CURB MARK NUMBER - GRANITE	G-1
CLEARING AND GRUBBING AREA	A
DRAINAGE NOTE	1
EROSION CONTROL NOTE	A
FENCING NOTE	A
GUARDRAIL NOTE	1
ITS NOTE	1
LIGHTING NOTE	A
TRAFFIC SIGNAL NOTE	1

STATE OF NEW HAMPSHIRE
BARNSTEAD
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

STANDARD SYMBOLS

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
9-1-2016	14121stdsymb1_2	14121	3	16

LEGEND

TYPE OF WETLAND IMPACT	SHADING/ HATCHING
NEW HAMPSHIRE WETLANDS BUREAU (PERMANENT NON-WETLAND)	
NEW HAMPSHIRE WETLANDS BUREAU & ARMY CORP OF ENGINEERS (PERMANENT WETLAND)	
TEMPORARY IMPACTS	

WETLAND DESIGNATION NUMBER

WETLAND IMPACT LOCATION

WETLAND MITIGATION AREA

MITIGATION

PREVIOUSLY PERMITTED IMPACTS

WETLANDS CLASSIFICATION CODES	
PEM1D	PALUSTRINE, EMERGENT, PERSISTENT, CONTINUOUSLY SATURATED
PEM1E	PALUSTRINE, EMERGENT, PERSISTENT, SEASONALLY FLOODED/SATURATED
PEM/PFO1E	PALUSTRINE, EMERGENT, PERSISTENT/PALUSTRINE, FORESTED, BROAD-LEAVED DECIDUOUS, SEASONALLY FLOODED/SATURATED
PEM/PSS1E	PALUSTRINE, EMERGENT, PERSISTENT/PALUSTRINE, SCRUB-SHRUB, BROAD-LEAVED DECIDUOUS, SEASONALLY FLOODED/SATURATED
PFO1E	PALUSTRINE, FORESTED, BROAD-LEAVED DECIDUOUS, SEASONALLY FLOODED/SATURATED
PSS1E	PALUSTRINE, SCRUB-SHRUB, BROAD LEAVED DECIDUOUS, SEASONALLY FLOODED/SATURATED
PSS/PFO1E	PALUSTRINE, SCRUB-SHRUB/PALUSTRINE, FORESTED, BROAD-LEAVED DECIDUOUS, SEASONALLY FLOODED/SATURATED
PSS/PFO1Fh	PALUSTRINE, SCRUB-SHRUB/PALUSTRINE, FORESTED, BROAD-LEAVED DECIDUOUS, SEMIPERMANENTLY FLOODED, DIKED/IMPOUNDED
PUBHh	PALUSTRINE, UNCONSOLIDATED BOTTOM, PERMANENTLY FLOODED, DIKED/IMPOUNDED
R2UB1,2	RIVERINE, LOWER PERENNIAL, UNCONSOLIDATED BOTTOM, COBBLE-GRAVEL, SAND
R2UB4	RIVERINE, LOWER PERENNIAL, UNCONSOLIDATED BOTTOM, ORGANIC
R4SB3,4	RIVERINE, INTERMITTENT, STREAMBED, COBBLE-GRAVEL, SAND

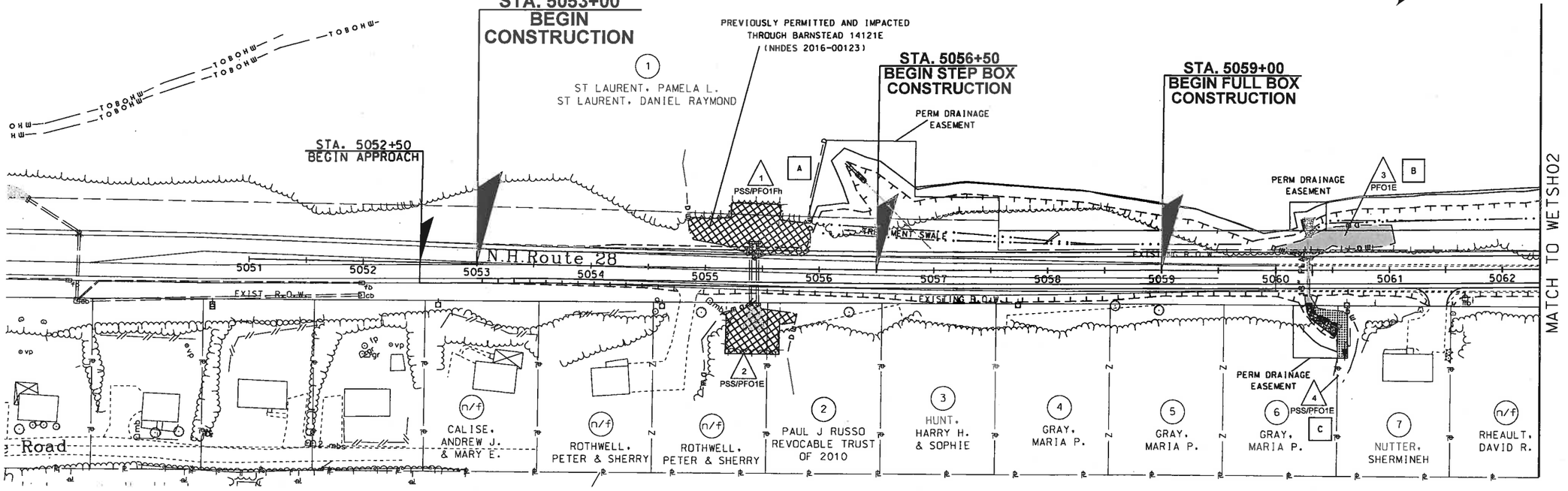
WETLAND IMPACT SUMMARY

WETLAND NUMBER	WETLAND PLANS SHEET NUMBER	WETLAND CLASSIFICATION	LOCATION	AREA IMPACTS						LINEAR STREAM IMPACTS FOR MITIGATION		
				PERMANENT				TEMPORARY		PERMANENT		
				N.H.W.B. (NON-WETLAND)		N.H.W.B. & A.C.O.E (WETLAND)				BANK LEFT	CHANNEL	BANK RIGHT
				SF	LF	SF	LF	SF	LF	LF	LF	LF
1	4	PSS/PFO1Fh	A					5				
3	4	PFO1E	B			1725						
4	4	PSS/PFO1E	C			211		525				
5	5	PFO1E	D			307		645				
9	5, 6	PSS1E	E			3090		1022				
10	5	PEM1D	F			1683		524				
11	5	R2UB4	G		73	208	40	74	18	40	40	33
12	6	PFO1E	H			1198		1121				
13	5	PEM/PSS1E	I			421		483				
14	5	R2UB1,2	J		51	181	28	30	11	23	28	28
17	6	PEM/PFO1E	K			851		911				
18	6	R4SB34	L			230	39	91	14		39	
19	6	R4SB34	M			153	25	69	16		25	
22	7	PEM/PFO1E	N			189		925				
24	7	PFO1E	O			1229		1686				
25	7	PEM1E	P			1985		346				
26	7	PFO1E	Q			5964		903				
27	9	PUBHh	R					341	13			
28	9	PFO1E	S			176		919				
29	9	PEM1D	T			368		500				
30	9	R2UB4	U		36	299	20	1421	17	20	20	16
31	9	R2UB1,2	V			446	17	2401			17	
32	9	BANK	W	77	13			801	99			13
33	9	BANK	X	559	68			550	47	68		
		TOTAL =		636	241	20914	169	16293	235	151	169	90

TOTAL PROJECT IMPACTS:
PERMANENT IMPACTS: 21.550 SF
TEMPORARY IMPACTS: 16.293 SF

TOTAL IMPACTS: 37.843 SF

GRID N



50 0 50 100
SCALE IN FEET

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	DATE

	NAME1	DATE	DATE1
SDR PROCESSED			
NEW DESIGN	AMC	DATE	03/2019
SHEET CHECKED	RDF	DATE	04/2019
AS BUILT DETAILS			DATE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

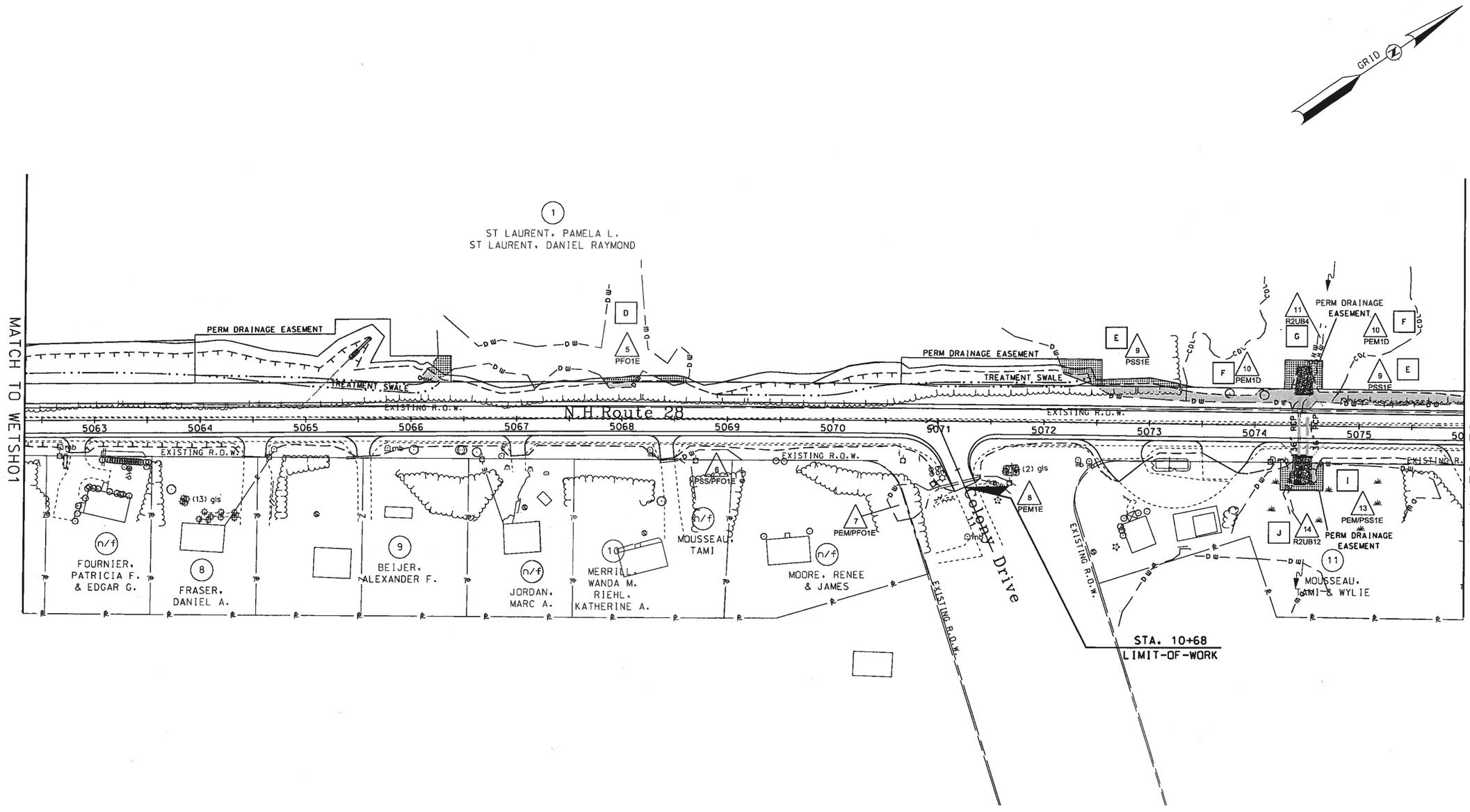
WETLAND PLANS

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
14121wetplans	14121	4	16

REVISIONS AFTER PROPOSAL

NUMBER	DATE	DESCRIPTION	STATION

	NAME1	DATE	DATE1
SDR PROCESSED			
NEW DESIGN	AMC	DATE	03/2019
SHEET CHECKED	RDF	DATE	04/2019
AS BUILT DETAILS		DATE	



STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

WETLAND PLANS

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
14121wetplans	14121	5	16

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED	NAME1	DATE DATE1
NEW DESIGN	AMC	DATE 03/2019
SHEET CHECKED	RDF	DATE 04/2019
AS BUILT DETAILS		DATE

GRID N

MATCH TO WETSH02

MATCH TO WETSH04

1
ST LAURENT, PAMELA L.
ST LAURENT, DANIEL RAYMOND

12 PFO1E H — PERM DRAINAGE EASEMENT — TREATMENT SWALE

17 PEM/PFO1E K — 18 R4SB34 L — PERM DRAINAGE EASEMENT — TREATMENT SWALE

EXISTING R.O.W.

N.H. Route 28

EXISTING R.O.W.

76 5077 5078 5079 5080 5081 5082 5083 5084 5085 5086 5087 5088

30' ROW

15 PEM/PSS1E — 16 PUBHx

18" PLASTIC

12
LOCKE LAKE COLONY ASSN.

LOCKE LAKE COLONY ASSN.

LOCKE LAKE COLONY ASSN.

LOCKE LAKE COLONY ASSN.

PEPE, JOSEPH

KIRPOLENKO, JOHN M.
KIRPOLENKO, EDWARD R.

HART, ALLAN E. & DOROTHY A.

HART, ALLAN E. & DOROTHY A.

20 PFO1E — PERM DRAINAGE EASEMENT — PERM DRAINAGE EASEMENT — M — 19 R4SB34

PERM DRAINAGE EASEMENT

Danbury Road

13
LOCKE LAKE COLONY ASSN.

STA. 20+55
LIMIT-OF-WORK

PERM DRAINAGE EASEMENT

50 0 50 100
SCALE IN FEET

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

WETLAND PLANS

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
14121wetplans	14121	6	16

MATCH TO WETSH05

MATCH TO WETSH03

MATCH TO WETSH06

GRID N

1
ST LAURENT, PAMELA L.
ST LAURENT, DANIEL RAYMOND

17
ST LAURENT, PAMELA L.
ST LAURENT, DANIEL RAYMOND

North Road

NH Route 28

North Barnstead Road

PERM DRAINAGE EASEMENT

EXISTING R.O.W.

18" PLAS

16
TOWN OF BARNSTEAD

18
TOWN OF BARNSTEAD

19
TOWN OF BARNSTEAD

19 -1
TOWN OF BARNSTEAD

20
JAMES N. LOCKE 1998 TRUST

14
LOCKE LAKE COLONY ASSN.

15
LTL INVESTMENT GROUP, LLC

16 -1
PARIS, JENNIFER A. & CHRISTOPHER

n/f
BENNETTE, JAMIE

n/f
ELLIOTT, MICHAEL & BARBARA L.

21 PFO1E

22 PEM/PFO1E

23 PUBHh

24 PFO1E

25 PEM1E

26 PFO1E

TEMP CONTRUCTION EASEMENT

STA. 403+25
END FULL BOX CONSTRUCTION

STA. 403+50
LIMIT-OF-WORK

SCALE IN FEET
50 0 50 100

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED	NAME1	DATE DATE1
NEW DESIGN	AMC	DATE 03/2019
SHEET CHECKED	RDF	DATE 04/2019
AS BUILT DETAILS		DATE

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

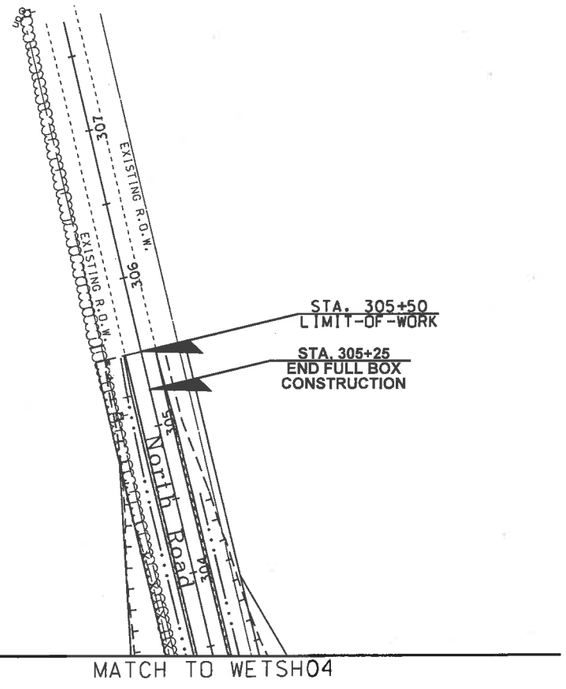
WETLAND PLANS

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
14121wetplans	14121	7	16

REVISIONS AFTER PROPOSAL

STATION	DESCRIPTION	NUMBER	DATE	STATION

SDR PROCESSED	NAME1	DATE DATE1
NEW DESIGN	AMC	DATE 03/2019
SHEET CHECKED	RDF	DATE 04/2019
AS BUILT DETAILS		DATE



50 0 50 100
SCALE IN FEET

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

WETLAND PLANS

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
14121wetplans	14121	8	16

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	DATE	STATION

	NAME	DATE
SDR PROCESSED	NAME1	DATE1
NEW DESIGN	AMC	03/2019
SHEET CHECKED	RDF	04/2019
AS BUILT DETAILS		DATE

MATCH TO WETSH04

GRID N

STA. 5114+50
END CONSTRUCTION

STA. 5114+00
END FULL BOX CONSTRUCTION

STA. 5115+00
END APPROACH

STA. 62+15
LIMIT-OF-WORK

STA. 71+60
LIMIT-OF-WORK

N.H. Route 28

Cresent Lake Brook

CLEAR TO SLOPE LINE

TREATMENT SWALE

17 ST LAURENT, PAMELA L.
ST LAURENT, DANIEL RAYMOND

21 LOCKE LAKE COLONY ASSOC.

22 MCPHEE, JOHN E. & SUSAN L.

23 LOCKE LAKE COLONY ASSON.

23 LOCKE LAKE COLONY ASSOC.

24 BENNETT, THOMAS

25 MCKINNISS, JAMES A.

26 PLANTE, JEFFREY G. & HEATHER A.

27 BRUHMULLER, JAMES J. & ANN M.

28 DASCOLI, GERALD J. & MARY JANE

n/f DASCOLI, GERALD J. & MARY JANE

29 KELLEY, KATHRYN A.

30 BURKE, CHARLES F. & THERESA M.

PERM DRAINAGE EASEMENT

PERM DRAINAGE EASEMENT

PERM DRAINAGE EASEMENT

PERM DRAINAGE EASEMENT

27 PUBHh

28 PFO1E

29 PEM1D

30 R2UB4

31 R2UB12

32 BANK

33 BANK

EXISTING R.O.W.

EXISTING R.O.W. 1934 BETTERMENT

18" RCP

18" CMP

50 0 50 100
SCALE IN FEET

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

WETLAND PLANS

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
14121wetplans	14121	9	16

EROSION CONTROL STRATEGIES

1. ENVIRONMENTAL COMMITMENTS:
   - 1.1. THESE GUIDELINES DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH ANY CONTRACT PROVISIONS, OR APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.
   - 1.2. THIS PROJECT WILL BE SUBJECT TO THE US EPA'S NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORM WATER CONSTRUCTION GENERAL PERMIT AS ADMINISTERED BY THE ENVIRONMENTAL PROTECTION AGENCY (EPA). THIS PROJECT IS SUBJECT TO REQUIREMENTS IN THE MOST RECENT CONSTRUCTION GENERAL PERMIT (CGP).
   - 1.3. THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE NHDES WETLAND PERMIT, THE US ARMY CORPS OF ENGINEERS PERMIT, WATER QUALITY CERTIFICATION AND THE SPECIAL ATTENTION ITEMS INCLUDED IN THE CONTRACT DOCUMENTS.
   - 1.4. ALL STORM WATER, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION (DECEMBER 2008) (BMP MANUAL) AVAILABLE FROM THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES (NHDES).
   - 1.5. THE CONTRACTOR SHALL COMPLY WITH RSA 485-A:17, AND ALL, PUBLISHED NHDES ALTERATION OF TERRAIN ENV-WQ 1500 REQUIREMENTS (HTTP://DES.NH.GOV/ORGANIZATION/COMMISSIONER/LEGAL/RULES/INDEX.HTM)
   - 1.6. THE CONTRACTOR IS DIRECTED TO REVIEW AND COMPLY WITH SECTION 107.1 OF THE CONTRACT AS IT REFERS TO SPILLAGE, AND ALSO WITH REGARDS TO EROSION, POLLUTION, AND TURBIDITY PRECAUTIONS.

2. STANDARD EROSION CONTROL SEQUENCING APPLICABLE TO ALL CONSTRUCTION PROJECTS:
   - 2.1. PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH DISTURBING ACTIVITIES. PERIMETER CONTROLS AND STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AS SHOWN IN THE BMP MANUAL AND AS DIRECTED BY THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PREPARER.
   - 2.2. EROSION, SEDIMENTATION CONTROL MEASURES AND INFILTRATION BASINS SHALL BE CLEANED, REPLACED AND AUGMENTED AS NECESSARY TO PREVENT SEDIMENTATION BEYOND PROJECT LIMITS THROUGHOUT THE PROJECT DURATION.
   - 2.3. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED IN ACCORDANCE WITH THE CONSTRUCTION GENERAL PERMIT AND SECTION 645 OF THE NHDOT SPECIFICATIONS FOR ROAD AND BRIDGES CONSTRUCTION.
   - 2.4. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
     - (A) BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
     - (B) A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
     - (C) A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP-RAP HAS BEEN INSTALLED;
     - (D) TEMPORARY SLOPE STABILIZATION CONFORMING TO TABLE 1 HAS BEEN PROPERLY INSTALLED
   - 2.5. ALL STOCKPILES SHALL BE CONTAINED WITH A PERIMETER CONTROL. IF THE STOCKPILE IS TO REMAIN UNDISTURBED FOR MORE THAN 14 DAYS, MULCHING WILL BE REQUIRED.
   - 2.6. A WATER TRUCK SHALL BE AVAILABLE TO CONTROL EXCESSIVE DUST AT THE DIRECTION OF THE CONTRACT ADMINISTRATOR.
   - 2.7. TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL REMAIN UNTIL THE AREA HAS BEEN PERMANENTLY STABILIZED.
   - 2.8. CONSTRUCTION PERFORMED ANY TIME BETWEEN NOVEMBER 30" AND MAY 1" OF ANY YEAR SHALL BE CONSIDERED WINTER CONSTRUCTION AND SHALL CONFORM TO THE FOLLOWING REQUIREMENTS.
     - (A) ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15", OR WHICH ARE DISTURBED AFTER OCTOBER 15", SHALL BE STABILIZED IN ACCORDANCE WITH TABLE 1.
     - (B) ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15", OR WHICH ARE DISTURBED AFTER OCTOBER 15", SHALL BE STABILIZED TEMPORARILY WITH STONE OR IN ACCORDANCE WITH TABLE 1.
     - (C) AFTER NOVEMBER 30" INCOMPLETE ROAD SURFACES, WHERE WORK HAS STOPPED FOR THE SEASON, SHALL BE PROTECTED IN ACCORDANCE WITH TABLE 1.
     - (D) WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRE OF THE PROJECT IS WITHOUT STABILIZATION AT ONE TIME, UNLESS A WINTER CONSTRUCTION PLAN HAS BEEN APPROVED BY NHDOT THAT MEETS THE REQUIREMENTS OF ENV-WQ 1505.02 AND ENV-WQ 1505.05.
     - (E) A SWPPP AMENDMENT SHALL BE SUBMITTED TO THE DEPARTMENT, FOR APPROVAL, ADDRESSING COLD WEATHER STABILIZATION (ENV-WQ 1505.05) AND INCLUDING THE REQUIREMENTS OF NO LESS THAN 30 DAYS PRIOR TO THE COMMENCEMENT OF WORK SCHEDULED AFTER NOVEMBER 30".

GENERAL CONSTRUCTION PLANNING AND SELECTION OF STRATEGIES TO CONTROL EROSION AND SEDIMENT ON HIGHWAY CONSTRUCTION PROJECTS

3. PLAN ACTIVITIES TO ACCOUNT FOR SENSITIVE SITE CONDITIONS:
   - 3.1. CLEARLY FLAG AREAS TO BE PROTECTED IN THE FIELD AND PROVIDE CONSTRUCTION BARRIERS TO PREVENT TRAFFICKING OUTSIDE OF WORK AREAS.
   - 3.2. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS.
   - 3.3. PROTECT AND MAXIMIZE EXISTING NATIVE VEGETATION AND NATURAL FOREST BUFFERS BETWEEN CONSTRUCTION ACTIVITY AND SENSITIVE AREAS.
   - 3.4. WHEN WORK IS PERFORMED IN AND NEAR WATER COURSES, STREAM FLOW DIVERSION METHODS SHALL BE IMPLEMENTED PRIOR TO ANY EXCAVATION OR FILLING.
   - 3.5. WHEN WORK IS PERFORMED WITHIN 50 FEET OF SURFACE WATERS (WETLAND, OPEN WATER OR FLOWING WATER), PERIMETER CONTROL SHALL BE ENHANCED CONSISTENT WITH SECTION 2.1.2.1. OF THE 2012 NPDES CONSTRUCTION GENERAL PERMIT.

4. MINIMIZE THE AMOUNT OF EXPOSED SOIL:
   - 4.1. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS. MINIMIZE THE AREA OF EXPOSED SOIL AT ANY ONE TIME. PHASING SHALL BE USED TO REDUCE THE AMOUNT AND DURATION OF SOIL EXPOSED TO THE ELEMENTS AND VEHICLE TRACKING.
   - 4.2. UTILIZE TEMPORARY MULCHING OR PROVIDE ALTERNATE TEMPORARY STABILIZATION ON EXPOSED SOILS IN ACCORDANCE WITH TABLE 1.
   - 4.3. THE MAXIMUM AMOUNT OF DISTURBED EARTH SHALL NOT EXCEED A TOTAL OF 5 ACRES FROM MAY 1" THROUGH NOVEMBER 30", OR EXCEED ONE ACRE DURING WINTER MONTHS, UNLESS THE CONTRACTOR DEMONSTRATES TO THE DEPARTMENT THAT THE ADDITIONAL AREA OF DISTURBANCE IS NECESSARY TO MEET THE CONTRACTORS CRITICAL PATH METHOD SCHEDULE (CPM), AND THE CONTRACTOR HAS ADEQUATE RESOURCES AVAILABLE TO ENSURE THAT ENVIRONMENTAL COMMITMENTS WILL BE MET.

5. CONTROL STORMWATER FLOWING ONTO AND THROUGH THE PROJECT:
   - 5.1. DIVERT OFF SITE RUNOFF OR CLEAN WATER AWAY FROM THE CONSTRUCTION ACTIVITY TO REDUCE THE VOLUME THAT NEEDS TO BE TREATED ON SITE.
   - 5.2. DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM DISTURBED AREAS, SLOPES, AND AROUND ACTIVE WORK AREAS AND TO A STABILIZED OUTLET LOCATION.
   - 5.3. CONSTRUCT IMPERMEABLE BARRIERS AS NECESSARY TO COLLECT OR DIVERT CONCENTRATED FLOWS FROM WORK OR DISTURBED AREAS.
   - 5.4. STABILIZE, TO APPROPRIATE ANTICIPATED VELOCITIES, CONVEYANCE CHANNELS OR PUMPING SYSTEMS NEEDED TO CONVEY CONSTRUCTION STORMWATER TO BASINS AND DISCHARGE LOCATIONS PRIOR TO USE.
   - 5.5. DIVERT OFF-SITE WATER THROUGH THE PROJECT IN AN APPROPRIATE MANNER SO NOT TO DISTURB THE UPSTREAM OR DOWNSTREAM SOILS, VEGETATION OR HYDROLOGY BEYOND THE PERMITTED AREA.

6. PROTECT SLOPES:
   - 6.1. INTERCEPT AND DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM UNPROTECTED AND NEWLY ESTABLISHED AREAS AND SLOPES TO A STABILIZED OUTLET OR CONVEYANCE.
   - 6.2. CONSIDER HOW GROUNDWATER SEEPAGE ON CUT SLOPES MAY IMPACT SLOPE STABILITY AND INCORPORATE APPROPRIATE MEASURES TO MINIMIZE EROSION.
   - 6.3. CONVEY STORMWATER DOWN THE SLOPE IN A STABILIZED CHANNEL OR SLOPE DRAIN.
   - 6.4. THE OUTER FACE OF THE FILL SLOPE SHOULD BE IN A LOOSE RUFFLED CONDITION PRIOR TO TURF ESTABLISHMENT. TOPSOIL OR HUMUS LAYERS SHALL BE TRACKED UP AND DOWN THE SLOPE, DISKED, HARROWED, DRAGGED WITH A CHAIN OR MAT, MACHINE-RAKED, OR HAND-WORKED TO PRODUCE A RUFFLED SURFACE.

7. ESTABLISH STABILIZED CONSTRUCTION EXITS:
   - 7.1. INSTALL AND MAINTAIN CONSTRUCTION EXITS, ANYWHERE TRAFFIC LEAVES A CONSTRUCTION SITE ONTO A PUBLIC RIGHT-OF-WAY.
   - 7.2. SWEEP ALL CONSTRUCTION RELATED DEBRIS AND SOIL FROM THE ADJACENT PAVED ROADWAYS AS NECESSARY.

8. PROTECT STORM DRAIN INLETS:
   - 8.1. DIVERT SEDIMENT LADEN WATER AWAY FROM INLET STRUCTURES TO THE EXTENT POSSIBLE.
   - 8.2. INSTALL SEDIMENT BARRIERS AND SEDIMENT TRAPS AT INLETS TO PREVENT SEDIMENT FROM ENTERING THE DRAINAGE SYSTEM.
   - 8.3. CLEAN CATCH BASINS, DRAINAGE PIPES, AND CULVERTS IF SIGNIFICANT SEDIMENT IS DEPOSITED.
   - 8.4. DROP INLET SEDIMENT BARRIERS SHOULD NEVER BE USED AS THE PRIMARY MEANS OF SEDIMENT CONTROL AND SHOULD ONLY BE USED TO PROVIDE AN ADDITIONAL LEVEL OF PROTECTION TO STRUCTURES AND DOWN-GRADIENT SENSITIVE RECEPTORS.

9. SOIL STABILIZATION:
   - 9.1. WITHIN THREE DAYS OF THE LAST ACTIVITY IN AN AREA, ALL EXPOSED SOIL AREAS, WHERE CONSTRUCTION ACTIVITIES ARE COMPLETE, SHALL BE STABILIZED.
   - 9.2. IN ALL AREAS, TEMPORARY SOIL STABILIZATION MEASURES SHALL BE APPLIED IN ACCORDANCE WITH THE STABILIZATION REQUIREMENTS (SECTION 2.2) OF THE 2012 CGP. (SEE TABLE 1 FOR GUIDANCE ON THE SELECTION OF TEMPORARY SOIL STABILIZATION MEASURES.)
   - 9.3. EROSION CONTROL SEED MIX SHALL BE SOWN IN ALL INACTIVE CONSTRUCTION AREAS THAT WILL NOT BE PERMANENTLY SEEDED WITHIN TWO WEEKS OF DISTURBANCE AND PRIOR TO SEPTEMBER 15, OF ANY GIVEN YEAR. IN ORDER TO ACHIEVE VEGETATIVE STABILIZATION PRIOR TO THE END OF THE GROWING SEASON.
   - 9.4. SOIL TACKIFIERS MAY BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND REAPPLIED AS NECESSARY TO MINIMIZE SOIL AND MULCH LOSS UNTIL PERMANENT VEGETATION IS ESTABLISHED.

10. RETAIN SEDIMENT ON-SITE AND CONTROL DEWATERING PRACTICES:
    - 10.1. TEMPORARY SEDIMENT BASINS (CGP-SECTION 2.1.3.2) OR SEDIMENT TRAPS (ENV-WQ 1506.10) SHALL BE SIZED TO RETAIN, ON SITE, THE VOLUME OF A 2-YEAR 24-HOUR STORM EVENT FOR ANY AREA OF DISTURBANCE OR 3,600 CUBIC FEET OF STORMWATER RUNOFF PER ACRE OF DISTURBANCE, WHICHEVER IS GREATER. TEMPORARY SEDIMENT BASINS USED TO TREAT STORMWATER RUNOFF FROM AREAS GREATER THAN 5-ACRES OF DISTURBANCE SHALL BE SIZED TO ALSO CONTROL STORMWATER RUNOFF FROM A 10-YEAR 24 HOUR STORM EVENT. ON-SITE RETENTION OF THE 10-YEAR 24-HOUR EVENT IS NOT REQUIRED.
    - 10.2. CONSTRUCT AND STABILIZE DEWATERING INFILTRATION BASINS PRIOR TO ANY EXCAVATION THAT MAY REQUIRE DEWATERING.
    - 10.3. TEMPORARY SEDIMENT BASINS OR TRAPS SHALL BE PLACED AND STABILIZED AT LOCATIONS WHERE CONCENTRATED FLOW (CHANNELS AND PIPES) DISCHARGE TO THE SURROUNDING ENVIRONMENT FROM AREAS OF UNSTABILIZED EARTH DISTURBING ACTIVITIES.

11. ADDITIONAL EROSION AND SEDIMENT CONTROL GENERAL PRACTICES:
    - 11.1. USE TEMPORARY MULCHING, PERMANENT MULCHING, TEMPORARY VEGETATIVE COVER, AND PERMANENT VEGETATIVE COVER TO REDUCE THE NEED FOR DUST CONTROL. USE MECHANICAL SWEEPERS ON PAVED SURFACES WHERE NECESSARY TO PREVENT DUST BUILDUP. APPLY WATER, OR OTHER DUST INHIBITING AGENTS OR TACKIFIERS, AS APPROVED BY THE NHDES.
    - 11.2. ALL STOCKPILES SHALL BE CONTAINED WITH TEMPORARY PERIMETER CONTROLS. INACTIVE SOIL STOCKPILES SHOULD BE PROTECTED WITH SOIL STABILIZATION MEASURES (TEMPORARY EROSION CONTROL SEED MIX AND MULCH, SOIL BINDER) OR COVERED WITH ANCHORED TARPS.
    - 11.3. EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSPECTED IN ACCORDANCE WITH SECTION 645 OF NHDOT SPECIFICATIONS. WEEKLY AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.25 IN. OF RAIN PER 24-HOUR PERIOD. EROSION AND SEDIMENT CONTROL MEASURES WILL ALSO BE INSPECTED IN ACCORDANCE WITH THE GUIDANCE MEMO FROM THE NHDES CONTAINED WITHIN THE CONTRACT PROPOSAL AND THE EPA CONSTRUCTION GENERAL PERMIT.
    - 11.4. THE CONTRACTOR SHOULD UTILIZE STORM DRAIN INLET PROTECTION TO PREVENT SEDIMENT FROM ENTERING A STORM DRAINAGE SYSTEM PRIOR TO THE PERMANENT STABILIZATION OF THE CONTRIBUTING DISTURBED AREA.
    - 11.5. PERMANENT STABILIZATION MEASURES WILL BE CONSTRUCTED AND MAINTAINED IN LOCATIONS AS SHOWN ON THE CONSTRUCTION PLANS TO STABILIZE AREAS. VEGETATIVE STABILIZATION SHALL NOT BE CONSIDERED PERMANENTLY STABILIZED UNTIL VEGETATIVE GROWTH COVERS AT LEAST 85% OF THE DISTURBED AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL FOR ONE YEAR AFTER PROJECT COMPLETION.
    - 11.6. CATCH BASINS: CARE SHALL BE TAKEN TO ENSURE THAT SEDIMENTS DO NOT ENTER ANY EXISTING CATCH BASINS DURING CONSTRUCTION. THE CONTRACTOR SHALL PLACE TEMPORARY STONE INLET PROTECTION OVER INLETS IN AREAS OF SOIL DISTURBANCE THAT ARE SUBJECT TO SEDIMENT CONTAMINATION.
    - 11.7. TEMPORARY AND PERMANENT DITCHES SHALL BE CONSTRUCTED, STABILIZED AND MAINTAINED IN A MANNER THAT WILL MINIMIZE SCOUR. TEMPORARY AND PERMANENT DITCHES SHALL BE DIRECTED TO DRAIN TO SEDIMENT BASINS OR STORM WATER COLLECTION AREAS.
    - 11.8. WINTER EXCAVATION AND EARTHWORK ACTIVITIES NEED TO BE LIMITED IN EXTENT AND DURATION, TO MINIMIZE POTENTIAL EROSION AND SEDIMENTATION IMPACTS. THE AREA OF EXPOSED SOIL SHALL BE LIMITED TO ONE ACRE, OR THAT WHICH CAN BE STABILIZED AT THE END OF EACH DAY UNLESS A WINTER CONSTRUCTION PLAN, DEVELOPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST, IS REVIEWED AND APPROVED BY THE DEPARTMENT.
    - 11.9. CHANNEL PROTECTION MEASURES SHALL BE SUPPLEMENTED WITH PERIMETER CONTROL MEASURES WHEN THE DITCH LINES OCCUR AT THE BOTTOM OF LONG FILL SLOPES. THE PERIMETER CONTROLS SHALL BE INSTALLED ON THE FILL SLOPE TO MINIMIZE THE POTENTIAL FOR FILL SLOPE SEDIMENT DEPOSITS IN THE DITCH LINE.

BEST MANAGEMENT PRACTICES (BMP) BASED ON AMOUNT OF OPEN CONSTRUCTION AREA

12. STRATEGIES SPECIFIC TO OPEN AREAS LESS THAN 5 ACRES:
    - 12.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WQ 1500: ALTERATION OF TERRAIN FOR CONSTRUCTION AND USE ALL CONVENTIONAL BMP STRATEGIES.
    - 12.2. SLOPES STEEPER THAN 3:1 WILL RECEIVE TURF ESTABLISHMENT WITH MATTING.
    - 12.3. SLOPES 3:1 OR FLATTER WILL RECEIVE TURF ESTABLISHMENT ALONE.
    - 12.4. AREAS WHERE HAUL ROADS ARE CONSTRUCTED AND STORMWATER CANNOT BE TREATED THE DEPARTMENT WILL CONSIDER INFILTRATION.
    - 12.5. FOR HAUL ROADS ADJACENT TO SENSITIVE ENVIRONMENTAL AREAS OR STEEPER THAN 5%, THE DEPARTMENT WILL CONSIDER USING EROSION STONE, CRUSHED GRAVEL, OR CRUSHED STONE BASE TO HELP MINIMIZE EROSION ISSUES.
    - 12.6. ALL AREAS THAT CAN BE STABILIZED SHALL BE STABILIZED PRIOR TO OPENING UP NEW TERRITORY.
    - 12.7. DETENTION BASINS SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE A 2 YEAR STORM EVENT.

13. STRATEGIES SPECIFIC TO OPEN AREAS BETWEEN 5 AND 10 ACRES:
    - 13.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WQ 1500 ALTERATION OF TERRAIN AND SHALL USE CONVENTIONAL BMP STRATEGIES AND ALL TREATMENT OPTIONS USED FOR UNDER 5 ACRES WILL BE UTILIZED.
    - 13.2. DETENTION BASINS WILL BE CONSTRUCTED TO ACCOMMODATE THE 2-YEAR 24-HOUR STORM EVENT AND CONTROL A 10-YEAR 24-HOUR STORM EVENT.
    - 13.3. SLOPES STEEPER THAN A 3:1 WILL RECEIVE TURF ESTABLISHMENT WITH MATTING OR OTHER TEMPORARY SOIL STABILIZATION MEASURES DETAILED IN TABLE 1. THE CONTRACTOR MAY ALSO CONSIDER A SOIL BINDER IN ACCORDANCE WITH THE NHDES APPROVALS OR REGULATIONS. OTHER ALTERNATIVE MEASURES, SUCH AS BONDED FIBER MATRIXES (BFMS) OR FLEXIBLE GROWTH MEDIUMS (FGMS) MAY BE UTILIZED, IF MEETING THE NHDES APPROVALS AND REGULATIONS.
    - 13.4. SLOPES 3:1 OR FLATTER WILL RECEIVE TURF ESTABLISHMENT OR OTHER TEMPORARY SOIL STABILIZATION MEASURES DETAILED IN TABLE 1. THE CONTRACTOR MAY ALSO CONSIDER A SOIL BINDER IN ACCORDANCE WITH THE NHDES APPROVALS OR REGULATIONS.

14. STRATEGIES SPECIFIC TO OPEN AREAS OVER 10 ACRES:
    - 14.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WQ 1500 ALTERATION OF TERRAIN AND SHALL USE CONVENTIONAL BMP STRATEGIES AND ALL TREATMENT OPTIONS USED FOR UNDER 5 ACRES AND BETWEEN 5 AND 10 ACRES WILL BE UTILIZED.
    - 14.2. THE DEPARTMENT ANTICIPATES THAT SOIL BINDERS WILL BE NEEDED ON ALL SLOPES STEEPER THAN 3:1, IN ORDER TO MINIMIZE EROSION AND REDUCE THE AMOUNT OF SEDIMENT IN THE STORMWATER TREATMENT BASINS.
    - 14.3. THE CONTRACTOR WILL BE REQUIRED TO HAVE AN APPROVED DESIGN IN ACCORDANCE WITH ENV-WQ 1506.12 FOR AN ACTIVE FLOCCULANT TREATMENT SYSTEM TO TREAT AND RELEASE WATER CAPTURED IN STORM WATER BASINS. THE CONTRACTOR SHALL ALSO RETAIN THE SERVICES OF AN ENVIRONMENTAL CONSULTANT WHO HAS DEMONSTRATED EXPERIENCE IN THE DESIGN OF FLOCCULANT TREATMENT SYSTEMS. THE CONSULTANT WILL ALSO BE RESPONSIBLE FOR THE IMPLEMENTATION AND MONITORING OF THE SYSTEM.

TABLE 1

GUIDANCE ON SELECTING TEMPORARY SOIL STABILIZATION MEASURES

APPLICATION AREAS	DRY MULCH METHODS				HYDRAULICALLY APPLIED MULCHES[2]				ROLLED EROSION CONTROL BLANKETS[3]			
	HMT	WC	SG	CB	HM	SMM	BFM	FRM	SNSB	DNSB	DNSCB	DNCB
SLOPES[1]												
STEEPER THAN 2:1	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	YES
2:1 SLOPE	YES'	YES'	YES	YES	NO	NO	YES	YES	NO	YES	YES	YES
3:1 SLOPE	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO
4:1 SLOPE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO
WINTER STABILIZATION	4T/AC	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES
CHANNELS												
LOW FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
HIGH FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES

ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE
HMT	HAY MULCH & TACK	HM	HYDRAULIC MULCH	SNSB	SINGLE NET STRAW BLANKET
WC	WOOD CHIPS	SMM	STABILIZED MULCH MATRIX	DNSB	DOUBLE NET STRAW BLANKET
SG	STUMP GRINDINGS	BFM	BONDED FIBER MATRIX	DNSCB	2 NET STRAW-COCONUT BLANKET
CB	COMPOST BLANKET	FRM	FIBER REINFORCED MEDIUM	DNCB	2 NET COCONUT BLANKET

NOTES:
1. ALL SLOPE STABILIZATION OPTIONS ASSUME A SLOPE LENGTH ≤10 TIMES THE HORIZONTAL DISTANCE COMPONENT OF THE SLOPE, IN FEET.
2. PRODUCTS CONTAINING POLYACRYLAMIDE (PAM) SHALL NOT BE APPLIED DIRECTLY TO OR WITHIN 100 FEET OF ANY SURFACE WATER WITHOUT PRIOR WRITTEN APPROVAL FROM THE NH DEPARTMENT OF ENVIRONMENTAL SERVICES.
3. ALL EROSION CONTROL BLANKETS SHALL BE MADE WITH WILDLIFE FRIENDLY BIODEGRADABLE NETTING.

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

WETLAND IMPACT PLANS

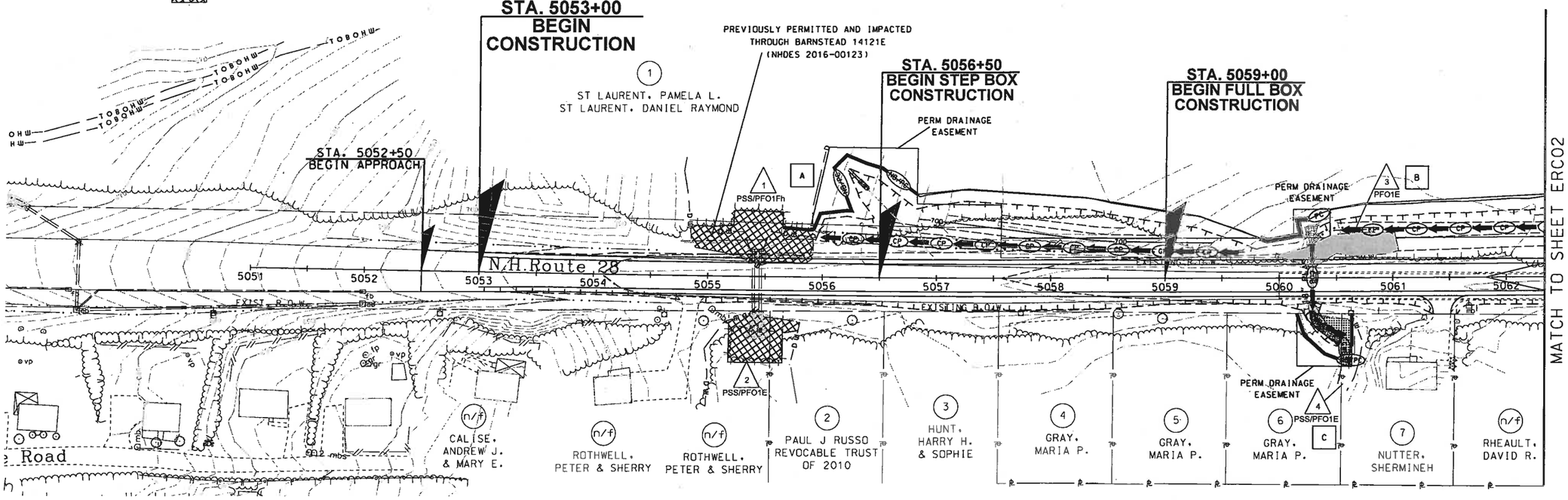
REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
12-21-2015	erosstrat	14121	10	16

LEGEND

TYPE OF WETLAND IMPACT	SHADING/ HATCHING
NEW HAMPSHIRE WETLANDS BUREAU (PERMANENT NON-WETLAND)	
NEW HAMPSHIRE WETLANDS BUREAU & ARMY CORP OF ENGINEERS (PERMANENT WETLAND)	
TEMPORARY IMPACTS	

- # — WETLAND DESIGNATION NUMBER
- # — WETLAND IMPACT LOCATION
- # — WETLAND MITIGATION AREA
- MITIGATION
- PREVIOUSLY PERMITTED IMPACTS

GRID Z



EROSION CONTROL PLAN LEGEND

- PC — PERIMETER CONTROL
  - SILT FENCE
  - EROSION CONTROL MIX BERM
  - EROSION CONTROL MIX SOX
  - TURBIDITY CURTAIN
  - SHEET PILE
  - COFFER DAM
- NB/PC — NATURAL BUFFER/PERIMETER CONTROL
  - SILT FENCE
  - EROSION CONTROL MIX BERM
  - EROSION CONTROL MIX SOX
  - TURBIDITY CURTAIN
  - SHEET PILE
  - COFFER DAM
- CP — CHANNEL PROTECTION
  - STONE CHECK DAMS
  - STRAW WATTLES
  - CHANNEL MATTING
  - CLASS D EROSION STONE
  - CLASS C STONE
- CWB — CLEAN WATER BYPASS
  - PUMP THROUGH PIPE
  - DRAIN THROUGH PIPE OR CHANNEL

50 0 50 100
SCALE IN FEET

REVISIONS AFTER PROPOSAL	NUMBER	DATE	STATION
DESCRIPTION			

	NAME1	DATE	DATE1
SDR PROCESSED			
NEW DESIGN	AMC	DATE	03/2019
SHEET CHECKED	RDF	DATE	04/2019
AS BUILT DETAILS		DATE	

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLANS

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
14121ercplans	14121	11	16

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

	NAME1	DATE	DATE1
SDR PROCESSED			
NEW DESIGN	AMC	DATE	03/2019
SHEET CHECKED	RDF	DATE	04/2019
AS BUILT DETAILS		DATE	

GRID N

MATCH TO SHEET ERC01

MATCH TO SHEET ERC03

1
ST LAURENT, PAMELA L.
ST LAURENT, DANIEL RAYMOND

PERM DRAINAGE EASEMENT

PERM DRAINAGE EASEMENT

PERM DRAINAGE EASEMENT

N.H. Route 28

EXISTING R.O.W.

EXISTING R.O.W.

EXISTING R.O.W.

EXISTING R.O.W.

EXISTING R.O.W.

5063 5064 5065 5066 5067 5068 5069 5070 5071 5072 5073 5074 5075

(43) gls

(2) gls

n/f
FOURNIER, PATRICIA F. & EDGAR G.

8
FRASER, DANIEL A.

9
BEIJER, ALEXANDER F.

n/f
JORDAN, MARC A.

10
MERRILL, WANDA M. RIEHL, KATHERINE A.

n/f
MOUSSEAU, TAMI

n/f
MOORE, RENEE & JAMES

Colony Drive

11
MOUSSEAU, TAMI & WYLIE

STA. 10+68
LIMIT-OF-WORK

D
5 PFO1E

6 PSS/PFO1E

7 PEM/PFO1E

E
9 PSS1E

8 PEM1E

F
10 PEM1D

G
11 R2UB4

10 PEM1D

9 PSS1E

I
13 PEM/PSS1E

J
14 R2UB12

PERM DRAINAGE EASEMENT

50 0 50 100
SCALE IN FEET

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

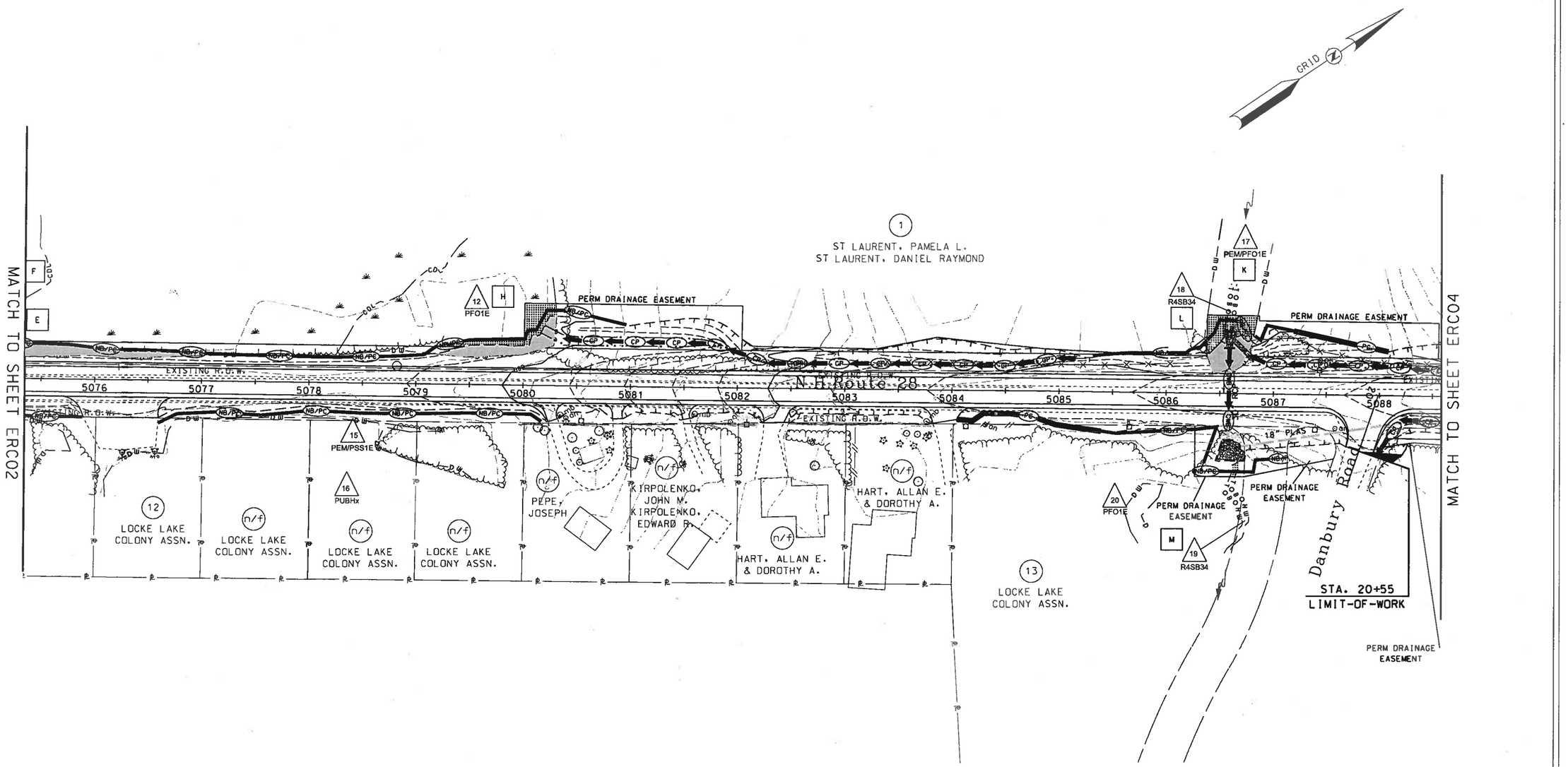
EROSION CONTROL PLANS

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
14121ercplans	14121	12	16

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED	NAME1	DATE DATE1
NEW DESIGN	AMC	DATE 03/2019
SHEET CHECKED	RDF	DATE 04/2019
AS BUILT DETAILS		DATE



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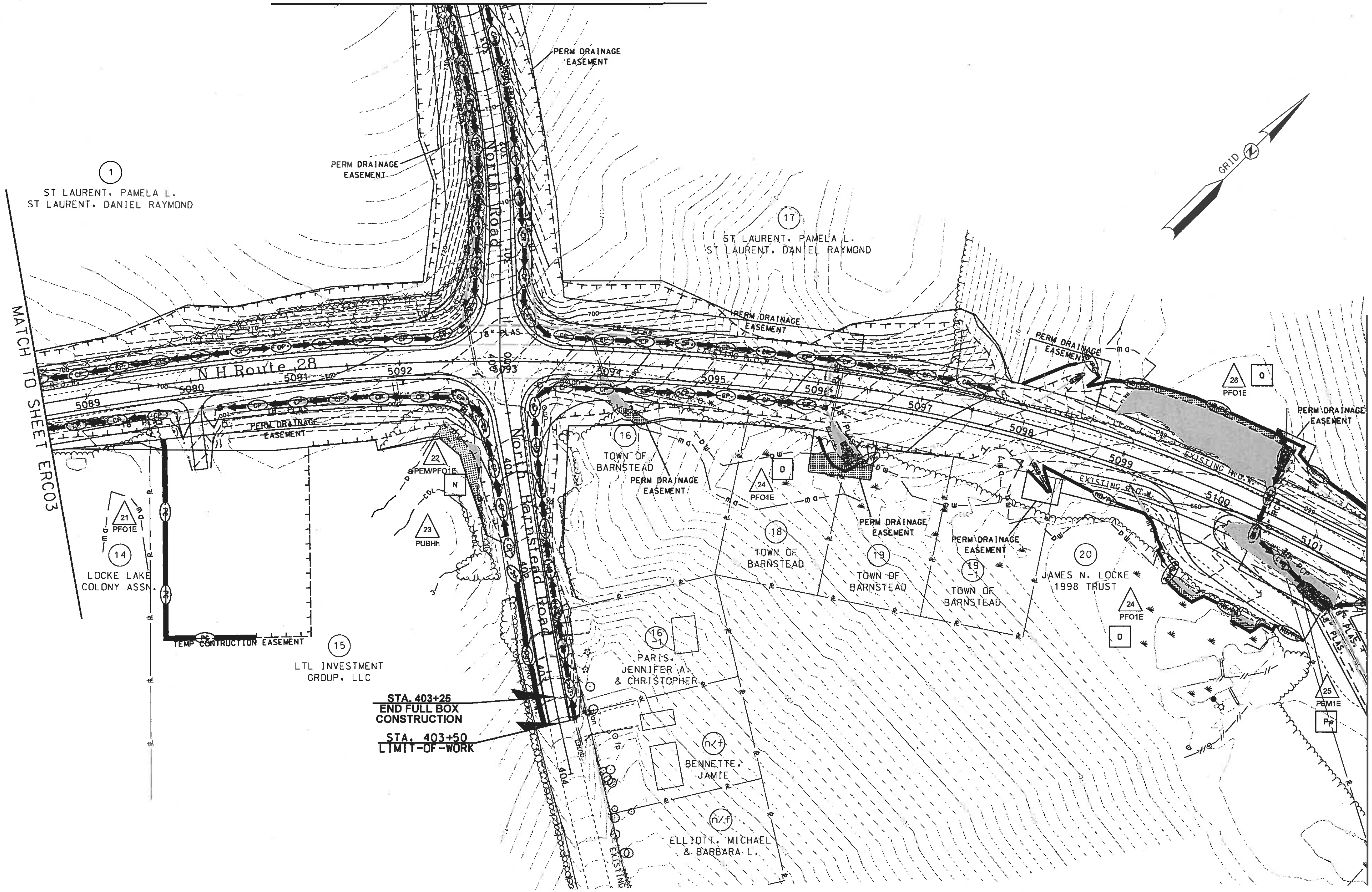
SCALE IN FEET

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLANS

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
14121erc0ians	14121	13	16


MATCH TO SHEET ERC05
MATCH TO SHEET ERC03
MATCH TO SHEET ERC06
ST LAURENT, PAMELA L.
ST LAURENT, DANIEL RAYMOND
PERM DRAINAGE EASEMENT
N H Route 28
North Road
North Barnstead Road
TOWN OF BARNSTEAD
LOCKE LAKE COLONY ASSN.
TEMP CONTRUCTION EASEMENT
LTL INVESTMENT GROUP, LLC
STA. 403+25
END FULL BOX CONSTRUCTION
STA. 403+50
LIMIT-OF-WORK
PARIS, JENNIFER A. & CHRISTOPHER
BENNETTE, JAMIE
ELLIOTT, MICHAEL & BARBARA L.
JAMES N. LOCKE 1998 TRUST
EXISTING R.O.W.
PFO1E
PEM/PFO1E
PUBHh
PEM1E
GRID
SCALE IN FEET

REVISIONS AFTER PROPOSAL				
NUMBER	DATE	STATION	STATION	DESCRIPTION

SDR PROCESSED	NAME1	DATE DATE1
NEW DESIGN	AMC	DATE 03/2019
SHEET CHECKED	RDF	DATE 04/2019
AS BUILT DETAILS		DATE

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

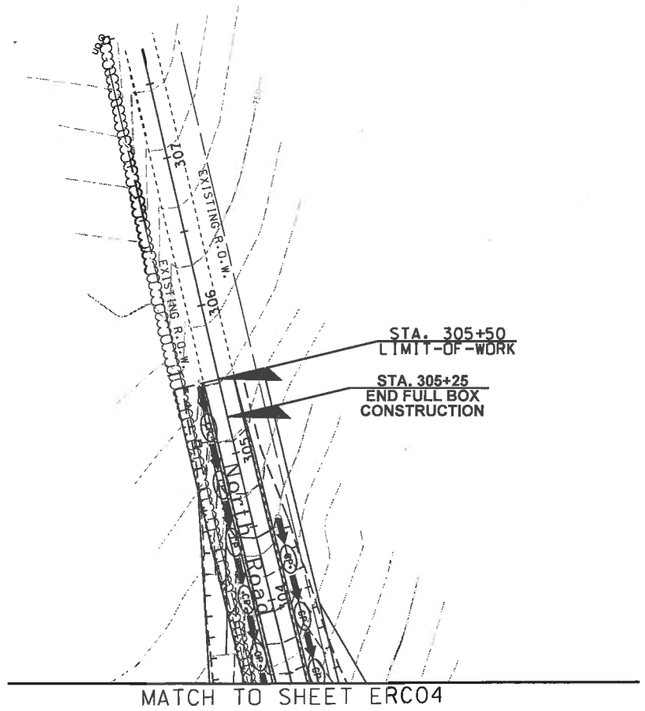
EROSION CONTROL PLANS

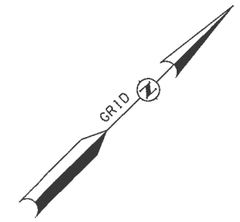
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
14121ercplans	14121	14	16

REVISIONS AFTER PROPOSAL

STATION	DESCRIPTION	NUMBER	DATE	STATION

SDR PROCESSED	NAME1	DATE DATE1
NEW DESIGN	AMC	DATE 03/2019
SHEET CHECKED	RDF	DATE 04/2019
AS BUILT DETAILS		DATE





50 0 50 100
SCALE IN FEET

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLANS

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
14121ercplans	14121	15	16

MATCH TO SHEET ERC04

STA. 5114+50
END CONSTRUCTION

STA. 5114+00
END FULL BOX CONSTRUCTION

STA. 5115+00
END APPROACH

STA. 62+15
LIMIT-OF-WORK

STA. 71+60
LIMIT-OF-WORK

N.H. Route 28

Crescent Gate Drive

17 ST LAURENT, PAMELA L.
ST LAURENT, DANIEL RAYMOND

21 LOCKE LAKE COLONY ASSOC

22 MCPHEE, JOHN E. & SUSAN I.

23 LOCKE LAKE COLONY ASSON.

23 LOCKE LAKE COLONY ASSOC.

24 BENNETT, THOMAS

25 MCKINNISS, JAMES A.

26 PLANTE, JEFFREY G. & HEATHER A.

27 BRUHMULLER, JAMES J. & ANN M.

28 DASCOLI, GERALD J. & MARY JANE

n/f DASCOLI, GERALD J. & MARY JANE

29 KELLEY, KATHRYN A.

30 BURKE, CHARLES F. & THERESA M.

PERM DRAINAGE EASEMENT

PERM DRAINAGE EASEMENT

PERM DRAINAGE EASEMENT

EXISTING R.O.W.

EXISTING R.O.W. 1934 BETTERMENT

CLEAR TO SLOPE LINE

BANK

BANK

PUBHh

PFO1E

PEM1D

R2UB4

R2UB12

50 0 50 100
SCALE IN FEET

REVISIONS AFTER PROPOSAL			
DESCRIPTION	DATE	NUMBER	STATION

SDR PROCESSED	NAME1	DATE	DATE1
NEW DESIGN	AMC	DATE	03/2019
SHEET CHECKED	RDF	DATE	04/2019
AS BUILT DETAILS		DATE	

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLANS

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
14121ercplans	14121	16	16